

(19)日本国特許庁(JP)

(12)公開特許公報(A)

(11)特許出願公開番号

特開平6-174614

(43)公開日 平成6年(1994)6月24日

(51)Int.Cl.<sup>5</sup>

G 0 1 N 1/28  
33/38

識別記号

E 7519-2J  
8310-2J

序内整理番号

F I

技術表示箇所

審査請求 未請求 請求項の数3(全11頁)

(21)出願番号 特願平5-163784

(22)出願日 平成5年(1993)6月10日

(31)優先権主張番号 実願平4-74668

(32)優先日 平4(1992)10月5日

(33)優先権主張国 日本(JP)

(71)出願人 000135209

株式会社ニフコ

神奈川県横浜市戸塚区舞岡町184番地1

(72)発明者 水野 明

神奈川県横浜市戸塚区舞岡町184番地1株

式会社ニフコ内

(72)発明者 植野 英治

神奈川県横浜市戸塚区舞岡町184番地1株

式会社ニフコ内

(72)発明者 小川 幸一

神奈川県横浜市戸塚区舞岡町184番地1株

式会社ニフコ内

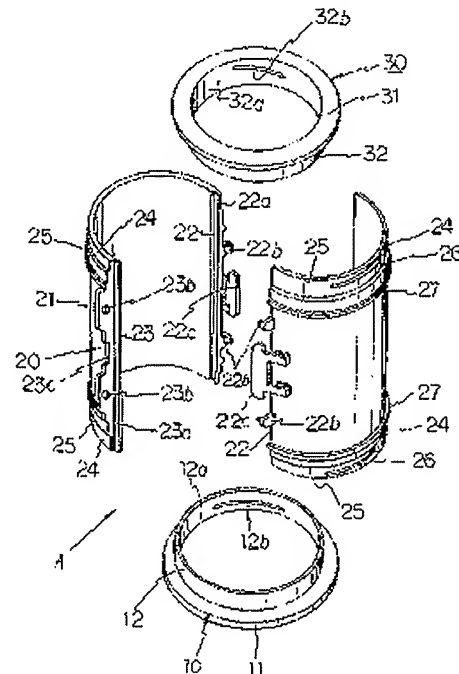
(74)代理人 弁理士 桑原 稔 (外1名)

(54)【発明の名称】 コンクリート強度試験用供試体成形用型枠

(57)【要約】

【目的】 コンクリート強度試験用の供試体を容易かつ正確に成形できる型枠を提供する。取り扱い易く安全であり、また、再使用ができる一方で使い捨ててもコスト的に支障のないコンクリート強度試験用供試体成形用型枠を提供する。

【構成】 プラスチック製の円盤状の底部材10、100と、組み合わされることにより筒体を構成する一対のプラスチック製筒構成材20、20・200、200と、筒体開口部に組み付けられるプラスチック製の環状枠30、300とから有底筒状の型枠を構成する。



## 【特許請求の範囲】

【請求項1】 プラスチック製の円盤状の底部材と、該底部材に組み付けられ、かつ、組み合わされて筒体を構成する相互に係脱自在の断面弧状の複数のプラスチック製筒構成材と、前記複数の筒構成材の形成する筒状開口部に組み付けられるプラスチック製の環状枠とからなることを特徴とするコンクリート強度試験用供試体成形用型枠。

【請求項2】 前記複数の筒構成材が この筒構成材の組み合わせにより構成される前記筒体の筒軸方向に沿った他の筒構成材との組み付け当接縁の少なくとも上端部、下端部及び中間部に夫々設けられる係合手段により、相互に係脱自在に組み付けられることを特徴とする請求項1記載のコンクリート強度試験用供試体成形用型枠。

【請求項3】 前記底部材及び環状枠の一方、又は、双方を金属製としたことを特徴する請求項1又は請求項2記載のコンクリート強度試験用供試体成形用型枠。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 この発明は、コンクリートの強度試験用の供試体を成形するための型枠に関する。

## 【0002】

【従来の技術】 コンクリートの強度試験用の供試体の成形型枠ないし容器として、従来よりJIS規格に定められている金属製型枠、ブリキ板等の金属板を有底筒状とした容器、あるいは特開昭62-22048号に示されるような切り取り線を有する使い捨て容器等が用いられている。

## 【0003】

【発明が解決しようとする課題】 しかしJIS規格に定められている金属製型枠は、厚肉の鋳造製とされることが多く、したがってそれ自体相当に重量があり、供試体成形のためにコンクリートを打ち込むと更にその重量は大きくなるので、取り扱いにくい。また、一般に高価となるので保守、管理に労力を払いながらの度重なる再使用を余儀なくされるものであった。

【0004】 一方、ブリキ板等の薄肉の金属板を円筒状に成形して形成した容器は、過重量による不都合は少ないものの、変形し易いため、容器内に打ち込まれたコンクリートを容器内に万遍なく行きわたらせるべく容器に衝撃を与える場合であっても、直接容器を木槌等で叩くことができず、該容器を別体の容器の中に入れて該別体の容器を叩くか、あるいは振動機を必要とするものであった。また、この容器内より硬化したコンクリートを取り出す場合、容器自体に継ぎ目がないために、容器を構成する金属板をベンチ等の工具をもって切り裂き、供試体から剥ぎ取る必要があり、この作業中に供試体を傷つけてしまうことがあった。従ってまた、この容器は再使用のできないものであった。

【0005】 これに対して特開昭62-22048号の

容器は、切り取り線を予め有するので、この切り取り線に沿って該容器を構成する側板を切り裂き、剥ぎ取って、容器と供試体とを分離できる。従って、硬化したコンクリートの取り出しが比較的容易であり、また、この取り出しにあたって供試体を傷つけることも少ない。その反面、前記薄肉の金属板を用いた容器同様、再使用ができず、また、前記側板の切り裂き、剥ぎ取りに手数を必要とするものであった。

【0006】 またこれら従来の容器に共通していえることは、供試体を成形しないときであっても所要の容量のある容器を分解等することなく、そのまま保管、運搬等せざるを得ないので、保管等に広いスペースを必要とすることである。

【0007】 そこでこの発明は、こうした従来のコンクリートの強度試験用の供試体の成形型枠ないし容器の有していた不都合を一掃して、JIS規格で要求されるコンクリート強度試験用の供試体を容易かつ正確に成形できると共に、取り扱い易く安全であり、また、再使用ができる一方で使い捨ててもコスト的に支障のないコンクリート強度試験用供試体成形用型枠を提供することを目的とする。

## 【0008】

【課題を解決するための手段】 前記目的を達成するため、請求項1に係る発明では、コンクリート強度試験用供試体成形用型枠A、Bを、プラスチック製の円盤状の底部材10、100と、該底部材10、100に組み付けられ、かつ、組み合わされて筒体を構成する相互に係脱自在の断面弧状の複数のプラスチック製筒構成材20、200、2000、200と、前記複数の筒構成材の形成する筒状開口部に組み付けられるプラスチック製の環状枠30、300とからなる構造のものとした。

【0009】 また、請求項2に係る発明では、前記複数の筒構成材20、200・2000、2000を、この筒構成材20、200・2000、2000の組み合わせにより構成される前記筒体の筒軸方向に沿った他の筒構成材との組み付け当接縁の少なくとも上端部、下端部及び中間部に夫々設けられる係合手段22、23・202、203により、相互に係脱自在に組み付けられる構造のものとしてコンクリート強度試験用供試体成形用型枠A、Bを構成した。

【0010】 また、請求項3に係る発明では、前記底部材10、100及び前記環状枠30、300の一方、又は、双方を金属製としてコンクリート強度試験用供試体成形用型枠A、Bを構成した。

## 【0011】

【作用】 この発明に係るコンクリート強度試験用供試体成形用型枠A、Bは、プラスチック製の円盤状の底部材10、100と、該底部材10、100に組み付けられ、かつ、組み合わされて筒体を構成する相互に係脱自在の断面弧状の複数のプラスチック製筒構成材20、2

0・200、200と、前記複数の筒構成材20・20・200、200の形成する筒状開口部に組み付けられるプラスチック製の環状棒30、300とからなるので、底部材10、100と筒構成材20、200と環状棒30、300との組み付け、分離を自在に行うことができる。また、組み付けられた底部材10、100と筒構成材20、200と環状棒30、300とにより、底部材10、100を底とする筒体を形成してコンクリートを打ち込む供試体成形空間を形成できる。

【0012】

【実施例】以下ではこの発明に係るコンクリート強度試験用供試体成形用型枠の典型的実施例を説明する。

【0013】先ず、図1ないし図4に基づいて第一の実施例に係る成形用型枠Aについて説明する。なお、図1は成形用型枠Aの分解斜視図、図2は成形用型枠Aの一部縦断面図、図3は成形用型枠Aの側面図、図4は図3におけるA-A線断面図である。

【0014】この実施例に係るコンクリート強度試験用供試体成形用型枠Aは、円盤状の底部材10と、該底部材10に組み付けられ、かつ、組み合わされて筒体を構成する一対の筒構成材20・20と、前記一対の筒構成材20、20の形成する筒状開口部に組み付けられる環状棒30とからなる。前記底部材10と筒構成材20と環状棒30とは、いずれもプラスチック材料を成形して構成されている。

【0015】底部材10は、円盤上の基盤11と、この基盤11の一方の面に設けられている短寸、円筒状の嵌込み筒部12とからなる。該嵌込み筒部12は、前記基盤11の縁よりも稍内側にその筒周面を配するように設けられている。該嵌込み筒部12の内壁12aには一対の凸条12bが対称位置に設けられており、この凸条12bは嵌込み筒部12の縁より該嵌込み筒部12の基部側に向けて緩やかに傾斜して設けられている。

【0016】筒構成材20は、断面半円弧状をなすと共に、同形同寸の対をなす他の筒構成材20と組み合わせられることにより、円筒を形成可能な湾曲板部21を有し、該湾曲板部21の長手方向に互る両側縁には対をなす他の筒構成材20と組み合わせずための係合手段22、23が設けられている。すなわち湾曲板部21の長手方向に互る一方の側縁には、湾曲板部21の内側に雄段差面22aを設けていると共に、この側縁より湾曲板部21の外側方に突設されている突片の前記湾曲板部21の非湾曲側に臨む面上に一対の係合突部22b、22bを設けている。そして、前記一対の係合突部22b・22b間の前記湾曲板部21の外周面より前記係合突部22b突出方向と同方向に延設される腕片により、前記湾曲板部21の側縁との間に間隔を開けて長方板状の係合板部22cが設けられており、該係合板部の前記湾曲板部21の側縁に向けられた側縁は、前記湾曲板部21の側縁とほぼ平行とされている。また湾曲板部21の長手方

向に互る他方の側縁には、湾曲板部21の外側に雌段差面23aを設けていると共に、この側縁より湾曲板部21の側方に向けて立設される板部に一対の係合孔部23b、23bを穿設している。そしてこの一対の係合孔部23b、23b間の板部の一部が切り欠かれて、係合凹部23cが形成されている。なお、前記筒構成材20の上部側に設けられている前記係合突部22bと該筒構成材20の上部縁との間隔は、前記筒構成材20の上部側に設けられている前記係合孔部23bと該筒構成材20の上部縁との間隔に略等しく、また、前記筒構成材の下部側に設けられている前記係合突部22bと該筒構成材20の下部縁との間隔は、前記筒構成材20の下部側に設けられている前記係合孔部23bと該筒構成材20の下部縁との間隔に略等しいものとされている。

【0017】また前記湾曲板部21の上部縁及び下部縁には段差面24・24が設けられており、この段差面24、24上には前記湾曲板部21の上部縁又は下部縁側より段差面24を形成する段部25近傍に向けて緩やかに傾斜する凸条26、26が突設されている。段部25と前記係合突部22b又は前記係合孔部23bとの間には、前記湾曲板部21の一方の側縁より他方の側縁に続く補強リブ27、27が延設されている。

【0018】こうした構造を有する一対の前記筒構成材20、20を組み合わせることによって、この実施例では円筒状の供試体を成形するためのコンクリートを詰め込む空間を形成する。すなわち前述のように、前記筒構成材20の上部側に設けられている前記係合突部22bと該筒構成材20の上部縁との間隔は、前記筒構成材20の上部側に設けられている前記係合孔部23bと該筒構成材20の上部縁との間隔に略等しい。また、前記筒構成材の下部側に設けられている前記係合突部22bと該筒構成材20の下部縁との間隔は、前記筒構成材20の下部側にも受けられている前記係合孔部23bと該筒構成材20の下部縁との間隔に略等しい。さらに前記係合突部22bが設けられている側の側縁には雄段差面22aが、前記係合孔部23bが設けられている側の側縁には雌段差面23aが設けられている。従って、一対の筒構成材20、20を、両筒構成材20、20の内側周面が互いに向き合うように配すると、両筒構成材20の雄段差面22aと雌段差面23aとを一致させながら、両筒構成材の係合突部22bと係合孔部23bとを係合させることができる。また両筒構成材20の係合板部22cの前記湾曲板部21の側縁に臨む側の側縁を係合凹部23cに係合させることができる。従ってこの実施例では、同形、同寸の一対の前記筒構成材20、20を組み付けることにより円筒体を形成することができる。なお同形、同寸の該筒構成材20、20の組付けにより前記凸条26は該筒構成材20、20が形成する筒状体の上部外側及び下部外側に対をなして対称に配置されることになる。

【0019】環状枠30は、リング状の枠体31と、この枠体31の内側縁に互って該枠体31の一方の面に向けて周設される嵌込み筒部32とより構成されており、該嵌込み筒部32の内壁32aには一組の凸条32bが対称に設けられており、この凸条32bは嵌込み筒部32の縁より該嵌込み筒部12の基部側に向けて緩やかに傾斜して設けられている。

【0020】こうした構造を有する底部材10と筒状体を形成する筒構成材20と環状枠30とは、図2ないし図4に示されるように、一体に組み付けることができる。すなわち筒構成材20、20を構成する湾曲板部21の上側縁及び下側縁に設けられた段差面24、24により、筒構成材20、20により形成される筒体の上部及び下部の開口部の外径は、底部材10の周回状の嵌込み筒部12の内径及び、環状枠30の周回状の嵌込み筒部32の内径よりも稍縮径としてあるので、前記筒体の下部開口部は前記底部材10の嵌込み筒部12の内側に収めることができ、また、前記筒体の上部開口部は前記環状枠30の嵌込み筒部32の内側に収めることができる。ここでこの実施例では、前記湾曲板部21に設けられた凸条26、26の傾斜の方向と、前記底部材10に設けられた凸条12bと前記環状枠30に設けられた凸条32bとの傾斜の方向を同一方向としてあるので、前記筒体に底部材10と環状枠30とを嵌め込みながら、該筒体又は該底部材10及び環状枠30を該凸条12b等の傾斜の方向に向けて回転させることにより、該凸条26、26と前記凸条12b及び前記凸条32bとを噛み合わせることができ、前記筒構成材20、20が形成する筒体の上下に底部材10及び環状枠30を密に固定することができる。なお前記凸条26は、前記湾曲板部21の周方向略中程の位置に条設されており、組み合わされた筒構成材20、20が形成する筒体では該筒構成材20、20の両当接縁を通る中心線を挟んだ略対称位置に該凸条26、26は配されることになるので、前記凸条12b及び前記凸条32bとの噛み合わせにより生じる該筒構成材20、20を前記筒体の内側に向けて締め付ける力を、組み合わされている該筒構成材20、20の両前記当接縁において略均等化することができる。前記筒構成材20、20の前記両当接縁に加わる締め込み力が前記筒体の一方側の前記当接縁と他方側の前記当接縁とで異なる場合、締め込み力が比較的弱く加えられている前記当接縁相互間に隙間が生じる可能性があるが、前記締め付け力の均等化により前記両筒構成材20、20相互間の組み付け状態を安定に維持することができる。また、このように前記筒体に前記底部材10及び前記環状枠30を固定しておけば、前記筒構成材20、20の形成する筒体の開口部の径は前記底部材10の嵌込み筒部12及び前記環状枠30の嵌込み筒部32の内径以上には広がらないので、打ち込まれたコンクリートの内圧により前記筒構成材20、20が側方に押し

広げられるような力を受けても、この方に抗してプラスチック製の筒構成材20、20が形成する筒体の形状を確実に保形することができる。また前記筒構成材20、20が形成する筒体の直径方向の断面形状が、該筒構成材20、20の成形後の収縮歪等により楕円状に歪んでいる場合であっても、前記基盤11面上に一体に設けられることから比較的眞円に近い精度に成形可能な。前記前記底部材10の前記嵌込み筒部12により前記筒体の歪を矯正することができる。なお、前記一組の筒構成材20、20の係合板部22cと係合凹部23cは、図2及び図3に示されるように、前記筒構成材20、20により形成される筒体の略中程の位置で互いに係合し合う構造とされて、打ち込まれたコンクリートの高圧により該筒構成材20、20が該筒体の中程の位置より押し広げられて、コンクリートが漏れ出したり、供試体が正確に成形されなくなったりする不都合の防止が図られている。

【0021】次いで、図5ないし図7に基づいて第二の実施例に係る成形用型枠Bについて説明する。なお、図5は成形用型枠Bの分解斜視図、図6は成形用型枠Bを構成する筒構成材200を外側から見た平面図、図7は前記筒構成材200を内側から見た平面図、図8は図7におけるX方向から見た側面図、図9は図7におけるY方向から見た側面図、図10は前記筒構成材200の平面図、図11は同底面図、図12は図6におけるB-B線断面図、図13は一對の前記筒構成材200、200の組み付け当接部の要部断面図、図14は底部材10の底面図、図15は図14におけるC-C線断面図、図16は前記底部材100と前記筒構成材200との組み付け状態を示す要部断面図、図17は前記筒構成材200と環状枠300との組み付け状態を示す平面図である。

【0022】図5に示されるように、この実施例に係るコンクリート強度試験用供試体成形用型枠Bは、円盤状の底部材100と、該底部材100に組み付けられ、かつ組み合わされて筒体を構成する複数の筒構成材200と、前記複数の筒構成材200の形成する筒状開口部に組み付けられる環状枠300とからなる。この実施例においても、前記底部材100と筒構成材200と環状枠300とはいずれもプラスチック材料を成形して構成されている。

【0023】前記筒構成材200は、断面半円弧状をなすと共に、同形同寸の対をなす他の筒構成材200と組み合わされることにより、筒体を形成可能な湾曲板部201を有し、該湾曲板部201の長手方向に互る両側縁には対をなす他の筒構成材200と組み合わせするための係合手段202、203が設けられている。

【0024】前記筒構成材200の長手方向に互る一方側縁に設けられている係合手段202は、該筒構成材200の上端から下端に向けて各々ほぼ等しい間隔を開け

て設けられる四か所の係合突部202a・・・202aから構成されている。各係合突部202aは、前記筒構成材200の湾曲板部201の外周側に向けて突き出すと共に、前記筒構成材200の長手方向互る側縁に一端を接する複数のリブから構成されている。このリブは前記一端側から他端側に向けて次第に立ち上がり幅が大きくなるように構成されており、前記筒構成材200の湾曲板部201の湾曲側に向けられた縁を係合縁202a'としている。

【0025】一方、前記筒構成材200の長手方向に互る他方側縁に設けられている係合手段203は、前記筒構成材200の上端から下端に向けて各々ほぼ等しい間隔を開けて設けられる四つの係合板203a・・・203aから構成されている。各係合板203aは、前記筒構成材200の湾曲板部201の周方向外側に向けて突き出すように設けられており、また厚さ方向に穴203a''が透設されて前記筒構成材200の長手方向に互る側縁側を向き、かつ、該側縁にほぼ平行な係合縁203a'を備えている。前記穴203a''は、前記筒構成材200の長手方向に互る他方側縁に設けられている各前記係合突部202a・・・202aを夫々収められる寸法とされている。

【0026】図7並びに図10、図11及び図12に示されるように、前記係合手段202が設けられている前記筒構成材200の長手方向に互る一方側縁面には、該筒構成材200の上端から下端に互って、四本の係合リブ204・・・204が設けられている。各係合リブ204は、他の係合リブ204に対して夫々平行に設けられている。また、前記筒構成材200の湾曲板部201の内周側及び外周側の二本の係合リブ204a、204a'に対して、この二本の係合リブ204a、204a'間に設けられている二本の係合リブ204b、204b'は、前記側縁面からの突き出し寸法を小さいものとしている。

【0027】また、前記係合手段203が設けられている前記筒構成材200の長手方向に互る他方側縁面には、該筒構成材200の上端から下端に互って、二本の溝205、205'が設けられている。

【0028】前記溝205の溝幅は、該溝205の開口側では前記係合リブ204a及び204bの双方をそのまま収め入れることができる幅とされており、また該溝205の溝底側ではその幅を開口側の幅に比べてやや小さいものとしている。従って、図13に示されるように、一対の前記筒構成材200、200'をその屈曲板部201の内周側が互いに向き合うように配し、両筒構成材200、200'がその長手方向に互る縁部を互いに接するように組み付けた場合、前記屈曲板部201の内周側の前記溝205内に前記屈曲板部201の内周側の前記係合リブ204a及びこの係合リブ204aに隣り合う前記係合リブ204bが、また、前記屈曲板部201

の外周側の前記溝205内に前記屈曲板部201の外周側の前記係合リブ204a及びこの係合リブ204aに隣り合う前記係合リブ204bが、夫々収められる。そして、前記係合リブ204aの先端が前記溝205の溝底側の側面に押し付けられるように収められる。この結果、両筒構成材200、200'が、相互に当接される前記側縁面を、前記屈曲板部201の内周側と外周側の二か所で夫々シールすることができ、両筒構成材200、200'の組み付けにより構成される筒体内に打ち込まれるコンクリートの漏れ出し防止効果が高められている。

【0029】また、前記筒構成材200の屈曲板部201の下側の内周面には、後述する底部材100を嵌込むための、該屈曲板部201の周方向に互る溝206が設けられている。この溝206の前記筒構成材200の下部縁側の溝縁部には、該溝206に沿って突き出すリブ206aが設けられている。

【0030】また、前記筒構成材200の屈曲板部201の上側の外周面には、該屈曲板部201の上端縁との間に稍間隔を開けて、該屈曲板部201の周方向に互る外縁状のフランジ207が設けられている。該フランジ207と該上端縁との間には、後述する環状枠300の嵌込み部208とされている。このフランジ207の前記筒構成材200の長手方向に互る側縁側の端部は、平坦面207aとされている。

【0031】また、前記筒構成材200の屈曲板部201の下側の外周面には、該屈曲板部201の周方向に互る外縁状のフランジ209が設けられている。

【0032】次いで、図1並びに図14及び図15に示されるように、前記円盤状の底部材100は、一面を平坦な面とする一方、他面には放射状の複数の筋強リブ101・・・101を形成している。また、該底部材100の縁部には、該底部材100の全周に互る凸条102が、該縁部よりもやや内側に設けられている前記補強リブ101との間にわずかに間隔を開けて、該底部材100の前記平坦な面側から前記筋強リブ101が設けられている側の面に向けて外広がりに設けられている。

【0033】次いで、図1に示されるように、前記環状枠300はリング状の板状枠であって、該環状枠300の形成する円の直径方向の両側に位置に、該環状枠300の一方の板面より、該板面に対してほぼ直交する向きに突き出す一対の係合突片301、301'を備えている。該係合突片301の先端部には、前記環状枠300の内側に向けられた係合爪302が設けられている。なお、前記係合突片301の基部より、やや前記環状枠300の内側よりの該環状枠300の面には、前記係合突片301の係合爪302の成形を容易にする目的で、窓穴303が形成されている。

【0034】以上に説明した構造を有する、一対の前記筒構成材200、200'と、底部材100と、環状枠100'とを以下のように組み付けることにより、第二の実

施例に係る成形用型枠Bが構成される。

【0035】まず、一対の前記筒構成材200、200を、該筒構成材200の前記湾曲板部201の内周面が互いに向き合うように配し、かつ、両前記筒構成材200、200の長手方向に互る両側縁面が互いに当接されるように、両筒構成材200、200を組み合わせる。ここで前記筒構成材200の長手方向に互る一方の側縁には前記係合手段202が設けられており、また他方の側縁には前記係合手段203が設けられており、しかも組み合わせられる両前記筒構成材200、200は同寸、同形とされているので、組み合わせられる一方の前記筒構成材200の前記係合手段202が設けられている側縁に、組み合わせられる他方の前記筒構成材200の前記係合手段203が設けられている側縁が当接され、また、組み合わせられる一方の前記筒構成材200の前記係合手段203が設けられている側縁に、組み合わせられる他方の前記筒構成材200の前記係合手段202が設けられている側縁が当接されることになる。ここで前記係合手段202は、複数のリブから構成される四か所の前記係合突部202a・・・202aから構成されており、また、前記係合手段203は、該係合突部202aを収め入れることのできる穴203a'を有する四つの係合板203aから構成されているので、前記各係合突部202a・・・202aを前記各係合板203a・・・203aの穴203a'に収め入れ、かつ、前記各係合板203a・・・203aの前記係合縁203a'に収め入れられた前記各係合突部202aの係合縁202a'を係合させることができ、これにより前記両筒構成材200、200を前記のように組み合わせた状態で固定することができる。特にこの実施例に係る型枠Bでは、相互に係合し合う前記係合板203aと前記係合突部202aが、前記筒構成材200の上端から下端に亘って四か所に設けられているので、組み合わせられた両前記筒構成材200、200の長手方向に互る当接縁相互の当接状態を、該当接縁の上側、中間、下側の各位置において十分に固定、維持でき、両前記筒構成材200、200により形成される筒体内に打ち込まれるコンクリートの漏れ出しが十分に防止できる構造とされている。

【0036】前記両筒構成材200、200の組み合わせにあたり、該両筒構成材200、200の前記湾曲板部201下側内周に設けられている溝206内に、前記底部材100の平坦な面が前記両筒構成材200、200により構成される筒体の内側に向けられるように、前記底部材100の縁部を収め入れることにより、該両筒構成材200、200間に前記底部材100が組み付けられて有底の筒体が構成される。ここで図16に示されるように、前記底部材100の縁部には、該底部材100の全周に互る凸条102が、前記底部材100の平坦な面側から前記補強リブ101が設けられている側に向けて外広がりに設けられているので、前記溝206内

への前記底部材100の縁部の収め入れに際しては、この凸条102はやや内向きに撓み込まれた状態で前記溝206の溝底面に弾性的に当接される構成とされており、前記両筒構成材200、200と該底部材100との接合部におけるシール性が高められている。

【0037】次いで、このように組み付けられた一対の筒構成材200、200の上部開口縁に形成されている前記嵌込み部208に前記環状枠300を嵌込む。これにより、両前記筒構成材200、200により形成される筒体を該環状枠300が形成する円形状に保形できると共に、組み合わせられた両筒構成材200、200の上部側における組み付け状態の強化を図ることができる。ここで、前記環状枠300には内向きの係合爪302を先端に有する係合突片301が設けられており、前記嵌めあわせに際して、この係合突片301の前記係合爪302が前記筒構成材200のフランジ207の平坦面207a部下側の該フランジ207と前記湾曲板部201外側周面との段差面207bに係合する構成とされており、環状枠300の前記嵌込み部208からの脱離の防止が図られている。

【0038】こうして一体に組み付けられる底部材100、100と、筒体を形成する筒構成材200、200と、環状枠300、300とにより形成される前記成形用型枠A及び成形用型枠Bの内部にコンクリートを打ち込み、供試体が成形されることになる。ここで前記両実施例に係る成形用型枠A及び成形用型枠Bでは、前記底部材100、100前記筒構成材200、200及び環状枠300、300のいずれもが金属等と比し、塑性変形しにくい反弾性変形をしやすいプラスチック材料より構成されているので、このコンクリートの打ち込みにあたりコンクリートが収納空間内に満遍なく行きわたるように本組等により前記筒構成材200、200等を叩いても該筒構成材200、200等が変形してしまわなく、該筒構成材200、200等の変形に起因する供試体の歪み、損傷等を起こすことがない。また、供試体を型枠A、B内から取り出すにあたっては、前記底部材100、100と環状枠300、300とを筒状体を構成する前記両筒構成材200、200・200、200から取り外した後、前記両筒構成材200、200・200、200の係合手段22、23・202、203の係合状態を解除するだけで容易に行うことができる。特に、コンクリートはプラスチックに付着しにくい性質を有することから、鉤物性の油等の變形材を前記型枠A、B内面に塗付等しなくとも、供試体の脱型に支障はない。また仮に、供試体の表面と前記筒構成材200、200等の内面とが経時的に接着した状態となっても、前記筒構成材200、200等を外側に撓ませることによって容易に供試体の表面より前記筒構成材200、200を剥すことができ、供試体の成形作業をスムーズに行うことができる。さらに、前記型枠A、B内周面に付着したコンクリートを簡単に取



り除くことができ、再使用も容易である。

【0039】なお、前記環状枠30、300及び前記底部材10、100の双方又は一方を金属製とした場合、プラスチック製とした場合に比べて寸法安定性が高いので、前記一対の筒構成材20、20・200、200により構成される筒体の開口を真円に近く保形することができ、また、成形される供試体の下端面の平面度を高めることができる。

【0040】また、この実施例では、成形コストの低減を図る見地から、前記有底筒状の成形枠を同形の10 一対の筒構成材20、20・200、200により構成しているが、この筒構成材20、20・200、200を三個以上組みあわせて前記成形用型枠を構成しても良い。

【0041】

【発明の効果】この発明に係るコンクリート強度試験用供試体成形用型枠A、Bによれば、底部材10、100と筒構成材20、200と環状枠30、300との組み付け、分離を自在に行うことができるので、JIS規格で要求されるコンクリート強度試験用の供試体を容易に 20 成形でき、また、型枠A、Bを損傷させることなく供試体を型枠A、B内より簡単に取り出すことができ、分離しての運搬保管が容易でしかも再使用が可能である。また型枠A、Bはプラスチック製であるので、木枠等で型枠A、Bを叩いても変形等することなくコンクリートを満遍なく型枠A、B内に行きわたらせることができ、供試体を正確に成形できると共に、金属製の型枠に比べ軽量で取り扱い易く安全であり、また、再使用ができる一方で使い捨てでもコスト的に支障がない。さらに型枠A、Bを弾性変形させることにより型枠A、Bに供試体 30 が接合してしまった場合であっても、供試体を傷つけることなく供試体より型枠A、B、特に前記筒構成材20、200を容易に取り外すことができる。

【図面の簡単な説明】

【図1】第一の実施例に係る成形用型枠の分解斜視図である。

【図2】同成形用型枠の一部破断側面図である。

【図3】同成形用型枠の側面図である。

【図4】図3におけるA-A線断面図である。

【図5】第二の実施例に係る成形用型枠の分解斜視図である。 40

【図6】同成形用型枠を構成する筒構成材200を外側から見た平面図である。

【図7】同成形用型枠を構成する筒構成材200を内側から見た平面図である。

【図8】図7におけるX方向から見た側面図である。

【図9】図7におけるY方向から見た側面図である。

【図10】第二の実施例に係る成形用型枠を構成する筒構成材200の平面図である。

【図11】同底面図である。

【図12】図6におけるB-B線断面図である。

【図13】第二の実施例に係る成形用型枠を構成する一対の前記筒構成材200、200の組み付け当接部の要部断面図である。

【図14】同成形用型枠を構成する底部材100の底面図である。

【図15】図14におけるC-C線断面図である。

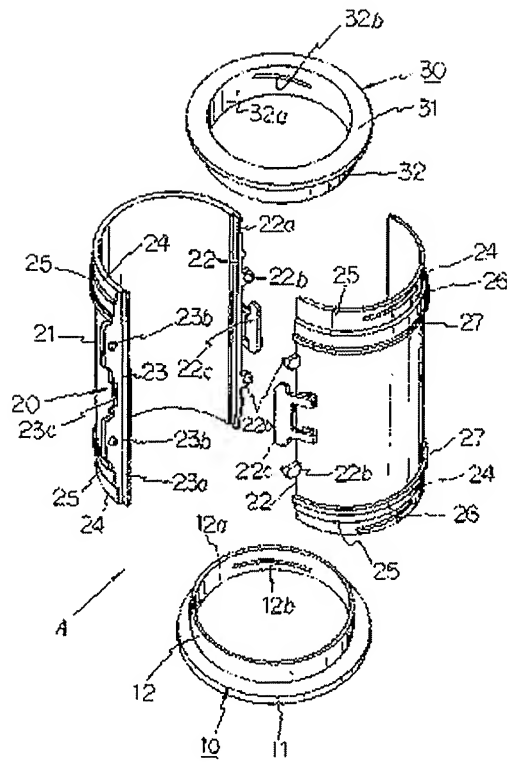
【図16】第二の実施例に係る成形用型枠を構成する底部材100と筒構成材200との組み付け状態を示す要部断面図である。

【図17】同成形用型枠を構成する筒構成材200と環状枠300との組み付け状態を示す平面図である。

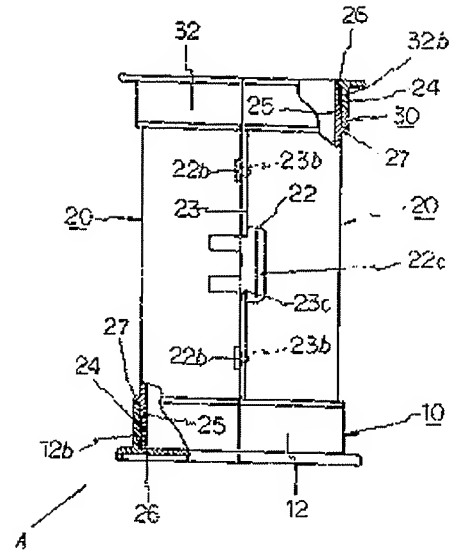
【符号の説明】

- 10 底部材
- 11 基盤
- 12 嵌込み筒部
- 20 筒構成材
- 21 湾曲板部
- 22 係合手段
- 23 係合手段
- 24 段差面
- 25 段部
- 26 凸条
- 27 縮強リブ
- 30 環状枠
- 31 枠体
- 32 嵌込み筒部
- 100 底部材
- 101 縮強リブ
- 102 凸条
- 200 筒構成材
- 201 湾曲板部
- 202 係合手段
- 203 係合手段
- 204 係合リブ
- 205 溝
- 206 溝
- 207 フランジ
- 208 嵌込み部
- 209 フランジ
- 300 環状枠
- 301 係合突片
- 302 係合爪
- 303 窓穴

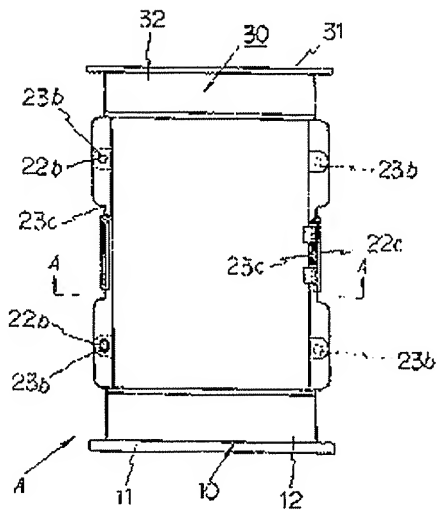
【図1】



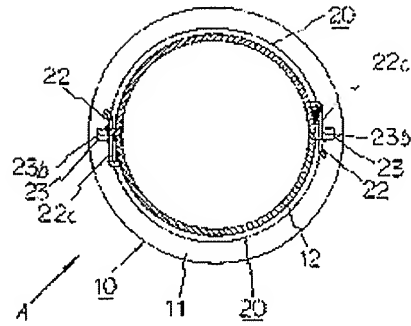
【図2】



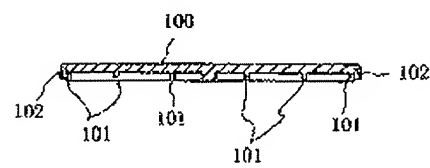
【図3】



【図4】

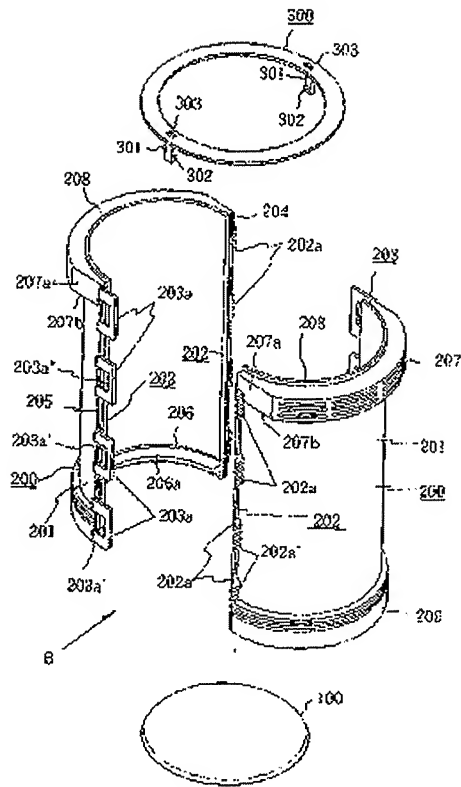


【図15】

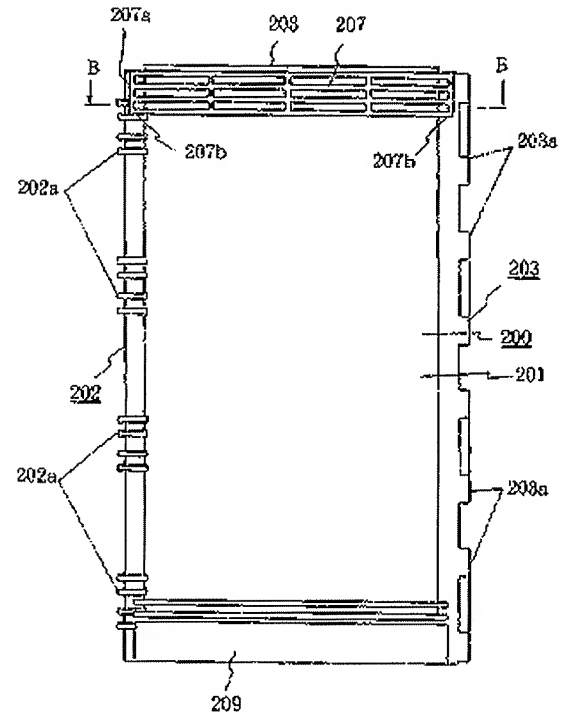




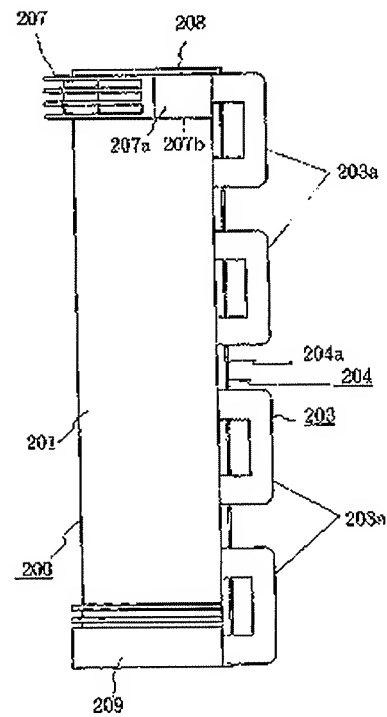
【図5】



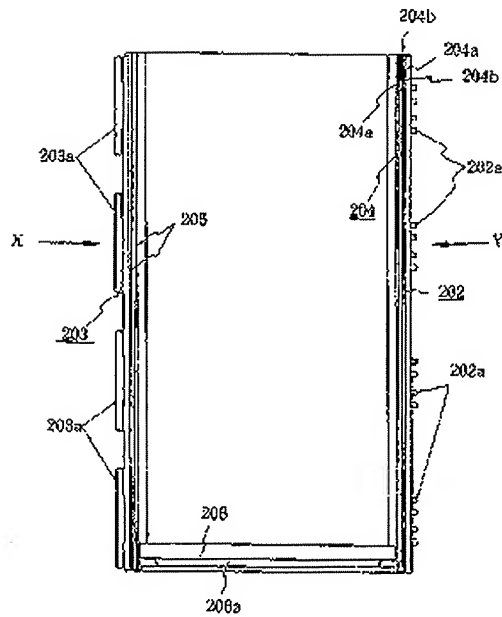
【図6】



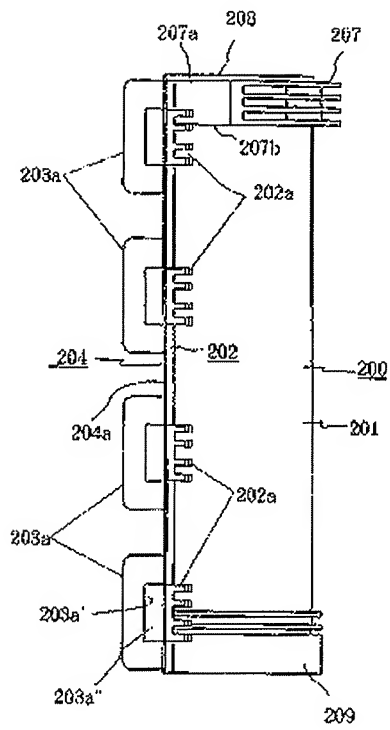
【図8】



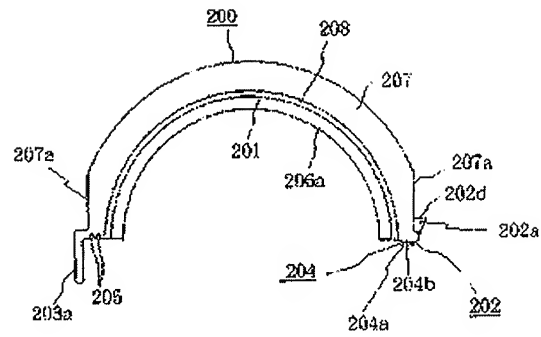
【図7】



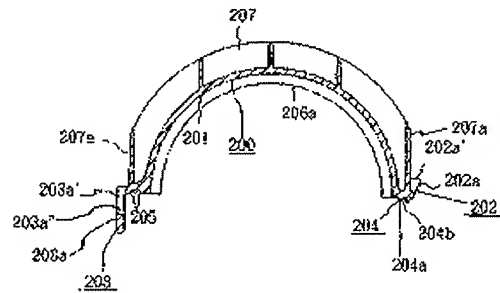
【図9】



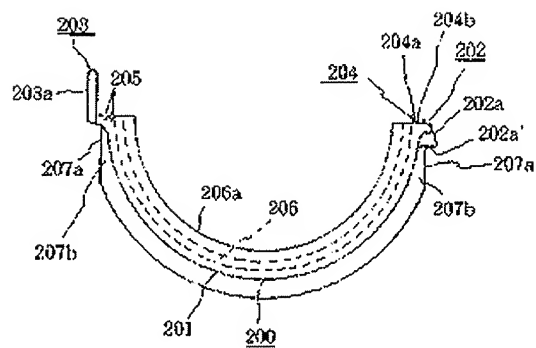
【図10】



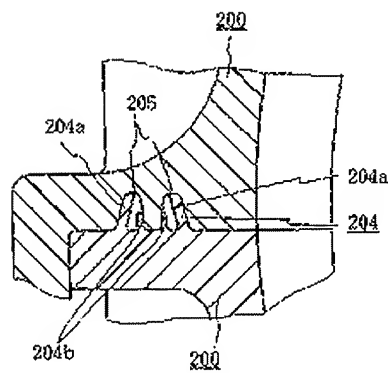
【図12】



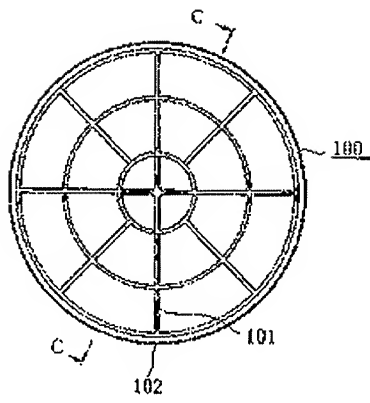
【図11】



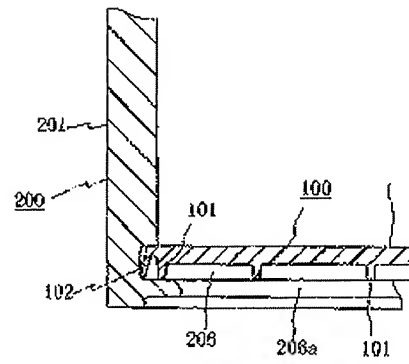
【図13】



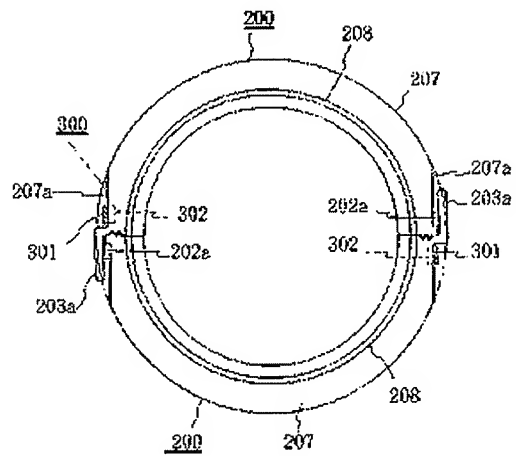
【図14】



【図16】



【図17】



## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 06-174614  
 (43)Date of publication of application : 24. 06. 1994

(51)Int. Cl. G01N 1/28  
 G01N 33/38

(21)Application number : 05-163784 (71)Applicant : NIFCO INC  
 (22)Date of filing : 10. 06. 1993 (72)Inventor : MIZUSAWA AKIRA  
 UENO EIJI  
 OGAWA KOICHI

## (30)Priority

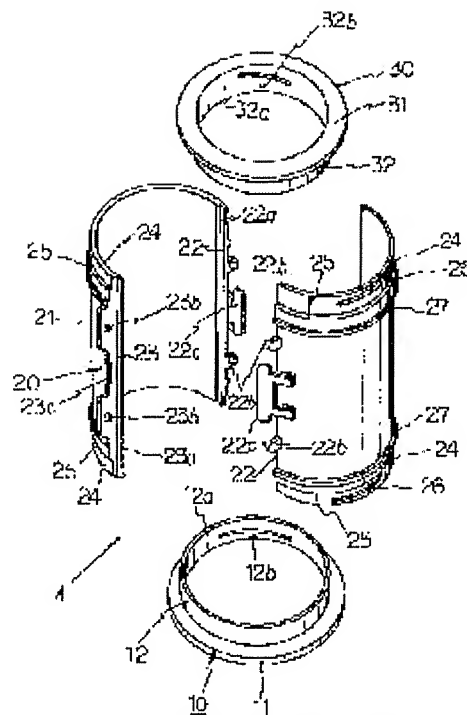
Priority number : 04 74668 Priority date : 05. 10. 1992 Priority country : JP

## (54) MOLD FOR MOCK-UP FOR TESTING CONCRETE STRENGTH

## (57)Abstract:

PURPOSE: To provide a mold for mock-up for testing concrete strength which is easily and exactly molding a mock-up for testing concrete strength, easily and safely treated and capable of reusing and wasting without cost problem.

CONSTITUTION: A cylindrical mold having a bottom is constituted of a bottom part 10 made of disk shape plastic, a pair of plastic made cylinder structure parts 20 forming a cylinder by combining them, and a plastic made annular frame 30 for assembling at the opening of the cylinder.



## LEGAL STATUS

[Date of request for examination] 16. 02. 2000  
 [Date of sending the examiner's decision of rejection] 19. 03. 2002  
 [Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]  
 [Date of final disposal for application]  
 [Patent number]  
 [Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

## \* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

## CLAIMS

[Claim(s)]

[Claim 1] Shuttering for specimen shaping for concrete strength tests characterized by consisting of two or more cylinder components made from plastics of a cross-section arc which can engage and release mutual [ which is attached to the disc-like bottom member and this bottom member made from plastics, and is combined with them, and constitutes a barrel ] freely, and an annular frame made from plastics attached to tubed opening which said two or more cylinder components form.

[Claim 2] Shuttering for specimen shaping according to claim 1 for concrete strength tests characterized by being attached mutually free [ engaging and releasing ] with the engagement means of an attachment contact edge with other cylinder components with which said two or more cylinder components met in the direction of a cylinder axis of said barrel constituted by the combination of this cylinder component formed in the upper limit section, the lower limit section, and pars intermedia at least, respectively.

[Claim 3] Shuttering for specimen shaping according to claim 1 or 2 for concrete strength tests which carries out the description of having made either said bottom member or an annular frame and both sides into metal.

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the shuttering for fabricating the specimen for the strength tests of concrete.

[0002]

[Description of the Prior Art] The container which made metal plates conventionally set to JIS, such as a metal form and a tin plate, the shape of a cylinder like object with base as the die frame thru/or container of a specimen for strength tests of concrete, or the nonreturnable container which has a perforated line as shown in JP,62-22048,A is used.

[0003]

[Problem(s) to be Solved by the Invention] However, since the weight will become large further if the metal form set to JIS is made into the heavy-gage product made from casting in many cases, therefore weight is in an equivalent for itself and concrete is driven in for specimen shaping, it is hard to deal with it. Moreover, since it generally became expensive, it was what is obliged to a repeated reuse while paying an effort to maintenance and management.

[0004] On the other hand, the container which fabricated the metal plate of thin meat, such as a tin plate, in the shape of a cylinder, and formed it Even if it is the case where an impact is given to a container in order to spread uniformly the concrete driven in in the container in a container since it is easy to deform although there is un-arranging [ little ] according to a too heavy amount It was what cannot strike an immediate container with a mallet etc., but puts in this container into the container of another object, and strikes the container of this another object, or needs a shaker. Moreover, since there was no joint in the container itself when taking out the concrete hardened from the inside of this container, the metal plate which constitutes a container might be torn apart with tools, such as cutting pliers, it needed to strip off from the specimen, and the specimen might be damaged during this activity. Therefore, this container was what cannot do a reuse again.

[0005] On the other hand, since the container of JP,62-22048,A has a perforated line beforehand, it tears apart and strips off the side plate which constitutes this container along with this perforated line, and can separate a container and a specimen. Therefore, the ejection of the hardened concrete is comparatively easy, and it is also rare to damage a specimen in this ejection. It was what needs trouble for a reuse not being made, and said side plate tearing apart, and stripping off like the container using the metal plate of said thin meat on the other hand.

[0006] Moreover, since storage, conveyance, etc. must be carried out as it is, without decomposition etc. carrying out a container with a necessary capacity even if it is a time of not fabricating a specimen, it being common in the container of these former is needing a large tooth space for storage etc.

[0007] Then, this invention is easy to deal with it and is safe while being able to fabricate easily and correctly the specimen for concrete strength tests which sweeps away un-arranging [ which the die frame of the specimen for the strength tests of such conventional concrete thru/or the container had ], and is demanded by JIS, and it aims at offering the shuttering for specimen shaping for concrete strength tests which is convenient in cost even if it uses and throws away, while a reuse is made.

[0008]

[Means for Solving the Problem] In order to attain said purpose, in invention concerning claim 1 The shuttering A and B for specimen shaping for concrete strength tests The disc-like bottom member 10,100 made from plastics, Two or more cylinder components 20 and 20 made from plastics of a cross-section arc which can engage and release mutual [ which is attached to this bottom member 10,100, and is combined with it, and constitutes a barrel ] freely, and 200,200, It considered as the thing of the structure which consists of an annular frame 30,300 made from plastics attached to tubed opening which said two or more cylinder components form.



[0009] In invention concerning claim 2, moreover, said two or more cylinder components 20 and 20-200,200 An attachment contact edge with this cylinder component 20 and other cylinder components which met in the direction of a cylinder axis of said barrel constituted by the combination of 20-200,200 at least The upper limit section, The shuttering A and B for specimen shaping for concrete strength tests was constituted as a thing of the structure mutually attached by the engagement means 22 and 23 formed in the lower limit section and pars intermedia, respectively, and 202 and 203 free [ engaging and releasing ].

[0010] Moreover, the shuttering A and B for specimen shaping for concrete strength tests consisted of invention concerning claim 3 by making either said bottom member 10,100 or said annular frame 30,300 and both sides into metal.

[0011]

[Function] The shuttering A and B for specimen shaping for concrete strength tests concerning this invention Two or more cylinder components 20 made from plastics of a cross-section arc which can engage and release mutual [ which is attached to the disc-like bottom member 10,100 and this bottom member 10,100 made from plastics and is combined with them and constitutes a barrel ] freely, and 20-200,200, Since it consists of said two or more cylinder components 20 and an annular frame 30,300 made from plastics attached to tubed opening which 20-200,200 forms, attachment by the bottom member 10,100, the cylinder component 20,200, and the annular frame 30,300 and separation can be performed free. Moreover, the specimen shaping space which forms the barrel which uses the bottom member 10,100 as a bottom, and drives in concrete with the bottom member 10,100 and the cylinder component 20,200 which were attached, and the annular frame 30,300 can be formed.

[0012]

[Example] Below, the typical example of the shuttering for specimen shaping for concrete strength tests concerning this invention is explained.

[0013] First, the shuttering A for shaping applied to the first example based on drawing 1 thru/or drawing 4 is explained. In addition, drawing 1 is the decomposition perspective view of the shuttering A for shaping, and drawing 2 is the A-A line sectional view [ in / a part / a fracture side elevation and drawing 3 , and / in drawing 4 / drawing 3 ] of the shuttering A for shaping. [ the side elevation of the shuttering A for shaping ]

[0014] The shuttering A for specimen shaping for concrete strength tests concerning this example consists of an annular frame 30 attached to tubed opening which the disc-like bottom member 10, the cylinder components 20 and 20 of the pair which is attached to this bottom member 10, and is combined with it, and constitutes a barrel, and the cylinder components 20 and 20 of said pair form. Said bottom member 10, cylinder component 20, and annular frame 30 all fabricate plastic material, and are constituted.

[0015] The bottom member 10 consists of an insertion cylinder part 12 of the shape of short \*\* and a cylinder prepared in the base 11 on a disk, and one field of this base 11. This insertion cylinder part 12 is formed so that the cylinder circumference side may be allotted to \*\*\*\*\* rather than the edge of said base 11. Protruding line 12b of a pair is prepared in wall 12a of this insertion cylinder part 12 at the position of symmetry, and from the edge of the insertion cylinder part 12, towards the base side of this insertion cylinder part 12, this protruding line 12b inclines gently, and is prepared.

[0016] While the cylinder component 20 makes a cross-section semicircle arc, by being combined with other cylinder components 20 which make the pair of the isomorphism said \*\*, it has curve Itabe 21 who can form a cylinder, and the engagement means 22 and 23 for combining with other cylinder components 20 which make a pair are formed in the edges on both sides covering this curve Itabe's 21 longitudinal direction. That is, [ curve Itabe's 21 longitudinal direction ], while while has prepared male level difference side 22a inside curve Itabe 21 at the side edge, the engagement projected parts 22b and 22b of a pair are formed on the field which attends the un-curving side of said curve Itabe 21 of the protruding piece which protrudes on curve Itabe's 21 method of an outside from this side edge. By and the piece of an arm installed in said engagement projected part 22b protrusion direction and this direction from the peripheral face of said curve Itabe 21 between engagement projected part 22b of said pair, and 22b Spacing is opened between said curve Itabe's 21 side edges, long direction tabular engagement Itabe 22c is prepared in it, and the side edge turned to the side edge of said curve Itabe 21 of this engagement Itabe is made almost parallel to said curve Itabe's 21 side edge. Moreover, while having prepared female level difference side 23a in curve Itabe's 21 outside at the side edge of another side covering curve Itabe's 21 longitudinal direction, the engagement pores 23b and 23b of a pair are drilled in Itabe set up towards curve Itabe's 21 side from this side edge. And some Itabe between engagement pore 23b of this pair and 23b cuts and lacks, and engagement crevice 23c is formed. In addition, spacing of the said engagement projected part 22b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20 Spread abbreviation etc. on spacing of the said engagement pore 23b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20. Moreover, let spacing of the said engagement projected part 22b and

the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component be an abbreviation equal at interval of the said engagement pore 23b and the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component 20.

[0017] Moreover, the level difference sides 24 and 24 are established in said curve Itabe's 21 up edge and lower edge, and this level difference side 24 and the protruding lines 26 and 26 which incline gently towards about 25 step which forms the level difference side 24 from said curve Itabe's 21 up edge or lower veranda on 24 are \*\*\*\*(ed). Between a step 25, said engagement projected part 22b, or said engagement pore 23b, the reinforcing ribs 27 and 27 which follow the side edge of another side from one side edge of said curve Itabe 21 are installed.

[0018] In this example, the space which stuffs the concrete for fabricating a cylinder-like specimen is formed by combining said cylinder components 20 and 20 of the pair which has such structure. namely, spacing of the said engagement pore 23b and the up edge of this cylinder component 20 where spacing of the said engagement projected part 22b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20 is prepared in the upper part side of said cylinder component 20 as mentioned above -- abbreviation -- it is equal. moreover, spacing of the said engagement pore 23b and the lower edge of this cylinder component 20 where the likeness by the side of the lower part of said cylinder component 20 has also received spacing of the said engagement projected part 22b and the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component -- abbreviation -- it is equal. Female level difference side 23a is prepared in the side edge of the side by which said engagement pore 23b is prepared for male level difference side 22a in the side edge of the side in which said engagement projected part 22b is furthermore prepared. Therefore, engagement projected part 22b of both the cylinder component and engagement pore 23b can be made engaged, if the cylinder components 20 and 20 of a pair are arranged so that the inside peripheral surface of both the cylinder components 20 and 20 may face mutually, making in agreement male level difference side 22a of both the cylinder component 20, and female level difference side 23a. Moreover, the side edge of the side which attends the side edge of said curve Itabe 21 of engagement Itabe 22c of both the cylinder component 20 can be made to engage with engagement crevice 23c. Therefore, in this example, a cylinder object can be formed by attaching isomorphism and said cylinder components 20 and 20 of the pair of this \*\*. In addition, said protruding line 26 of a twist makes a pair to attachment of isomorphism and these cylinder components 20 and 20 of this \*\* on the up outside and lower outside of a tube-like object which these cylinder components 20 and 20 form, and it will be arranged at the symmetry.

[0019] The annular frame 30 consists of a ring-like frame 31 and an insertion cylinder part 32 which covers the ulnar margin of this frame 31 and is attached towards one field of this frame 31, protruding line 32b of a lot is prepared in wall 32a of this insertion cylinder part 32 at the symmetry, and from the edge of the insertion cylinder part 32, towards the base side of this insertion cylinder part 12, this protruding line 32b inclines gently, and is prepared.

[0020] As indicated in drawing 2 thru/or drawing 4 as the bottom member 10 which has such structure, the cylinder component 20 which forms a tube-like object, and the annular frame 30, it can attach to one. According to namely, the level difference sides 24 and 24 established in curve Itabe's 21 top edge and bottom edge which constitute the cylinder components 20 and 20 The outer diameter of the upper part of the barrel formed with the cylinder components 20 and 20, and lower opening Since it has considered as \*\*\*\*\* rather than the bore of the insertion cylinder part 12 of the letter of the circumference of the bottom member 10, and the bore of the insertion cylinder part 32 of the letter of the circumference of the annular frame 30 Lower opening of said barrel can be stored inside the insertion cylinder part 12 of said bottom member 10, and up opening of said barrel can be stored inside the insertion cylinder part 32 of said annular frame 30. Since the direction [ b / the protruding line 26 and the direction of the inclination of 26 which were established in said curve Itabe 21 in this example, and / protruding line 12b prepared in said bottom member 10 and protruding line 32b prepared in said annular frame 30 ] of an inclination is made into the same direction here By rotating this barrel or this bottom member 10, and the annular frame 30 towards the direction of inclinations, such as this protruding line 12b, inserting the bottom member 10 and the annular frame 30 in said barrel These protruding lines 26 and 26, said protruding line 12b, and said protruding line 32b can be engaged, and the bottom member 10 and the annular frame 30 can be densely fixed to the upper and lower sides of the barrel which said cylinder components 20 and 20 form. In addition, said protruding line 26 is \*\*\*\*(ed) by the location in the middle of [ hoop direction abbreviation ] said curve Itabe 21. Since these protruding lines 26 and 26 will be allotted to the approximate line position of symmetry whose center line which passes along both the contact edge of these cylinder components 20 and 20 by the barrel which the cylinder components 20 and 20 put together form was pinched In both the aforementioned contact edge of these cylinder components 20 and 20 put together, abbreviation equalization of the force which turns these cylinder components 20 and 20 produced by tabling with said protruding line 12b and said protruding line 32b inside said barrel, and binds them tight can be carried out. Although a clearance may be generated between [ to which it fastens and the lump force is applied comparatively weakly /

said ] contact marginal when [ which joins said both contact edge of said cylinder components 20 and 20 ] it fastens and lump force differs on said contact edge of one side of said barrel, and said contact edge of the other side, said both cylinder component 20 and the attachment condition between 20 are maintainable to stability with equalization of said bolting force. Moreover, if said bottom member 10 and said annular frame 30 are fixed to said barrel in this way Since the path of opening of the barrel which said cylinder components 20 and 20 form does not spread more than the bore of the insertion cylinder part 12 of said bottom member 10, and the insertion cylinder part 32 of said annular frame 30 Even if it receives the force which said cylinder components 20 and 20 can extend to the side with the internal pressure of the driven-in concrete, shape retention of the configuration of the barrel which resists this force and the cylinder components 20 and 20 made from plastics form can be carried out certainly. Moreover, since the cross-section configuration of the diameter direction of the barrel which said cylinder components 20 and 20 form is established on the 11th page of said base at one even if it is the case where it is distorted in the shape of an ellipse by contraction distortion after shaping of these cylinder components 20 and 20 etc., distortion of said barrel is reformable with said insertion cylinder part 12 of said said bottom member 10 which can be fabricated for the precision comparatively near a perfect circle. In addition, engagement Itabe 22c of the cylinder components 20 and 20 of said lot and engagement crevice 23c As shown in drawing 2 and drawing 3 , it considers as the structure engaged for each other in the location in the middle of [ abbreviation ] the barrel formed with said cylinder components 20 and 20. These cylinder components 20 and 20 can extend from the location in the middle of this barrel according to the load of the driven-in concrete, concrete begins to leak or inconvenient prevention by which a specimen is no longer fabricated correctly is achieved.

[0021] Subsequently, the shuttering B for shaping applied to the second example based on drawing 5 thru/or drawing 17 is explained. In addition, the top view which looked at the cylinder component 200 with which drawing 5 constitutes the decomposition perspective view of the shuttering B for shaping, and drawing 6 constitutes the shuttering B for shaping from the outside, The top view where drawing 7 looked at said cylinder component 200 from the inside, the side elevation which looked at drawing 8 from X in drawing 7 , The side elevation and drawing 10 which looked at drawing 9 from Y in drawing 7 The top view of said cylinder component 200, A B-B line sectional view [ in / drawing 11 and / in drawing 12 / drawing 6 ] and drawing 13 The important section sectional view of the attachment contact section of said cylinder component 200,200 of a pair, [ this bottom view ] A C-C line sectional view [ in / drawing 14 , and / in drawing 15 / drawing 14 ], the important section sectional view in which drawing 16 shows the attachment condition of said bottom member 100 and said cylinder component 200, and drawing 17 are the top views showing the attachment condition of said cylinder component 200 and annular frame 300. [ the bottom view of the bottom member 100 ]

[0022] As shown in drawing 5 , the shuttering B for specimen shaping for concrete strength tests concerning this example consists of the disc-like bottom member 100, two or more cylinder components 200 which are attached to this bottom member 100, and are combined with it, and constitute a barrel, and an annular frame 300 attached to tubed opening which said two or more cylinder components 200 form. Also in this example, said bottom member 100, cylinder component 200, and annular frame 300 all fabricate plastic material, and are constituted.

[0023] While said cylinder component 200 makes a cross-section semicircle arc, by being combined with other cylinder components 200 which make the pair of the isomorphism said \*\*, it has curve Itabe 201 who can form a barrel, and the engagement means 202 and 203 for combining with other cylinder components 200 which make a pair are formed in the edges on both sides covering this curve Itabe's 201 longitudinal direction.

[0024] The engagement means 202 formed in the one side edge which covers the longitudinal direction of said cylinder component 200 is four engagement projected part 202a which opens almost equal spacing respectively and is prepared towards a lower limit from the upper limit of this cylinder component 200... It consists of 202a. Each engagement projected part 202a consists of two or more ribs which touch the longitudinal direction \*\*\*\* side edge of said cylinder component 200 in an end while projecting it towards the periphery side of curve Itabe 201 of said cylinder component 200. This rib is constituted so that it may start from said end side gradually towards an other end side and width of face may become large, and it makes the edge turned to the curve side of curve Itabe 201 of said cylinder component 200 engagement marginal 202a'.

[0025] The engagement means 203 formed in the other side edge which covers the longitudinal direction of said cylinder component 200 on the other hand is four engagement plate 203a which opens almost equal spacing respectively and is prepared towards a lower limit from the upper limit of said cylinder component 200... It consists of 203a. Each engagement plate 203a was prepared so that it might project towards the hoop direction outside of curve Itabe 201 of said cylinder component 200, and hole 203a" was \*\*\*\*(ed) in the thickness direction, and it turned to the side edge side covering the longitudinal direction of said cylinder component 200, and is equipped with engagement marginal 203a' almost parallel to this side edge. each aforementioned engagement projected part 202a prepared in the other side edge on which said hole 203a" covers the longitudinal direction of said cylinder component 200 ... it considers as the dimension

which can store 202a, respectively.

[0026] As shown in the drawing 7 list at drawing 10 , drawing 11 , and drawing 12 , a lower limit is covered from the upper limit of this cylinder component 200, and the engagement rib 204...204 of Shijo is formed in the one side edge surface which covers the longitudinal direction of said cylinder component 200 with which said engagement means 202 is established. Each engagement rib 204 is formed in parallel to other engagement ribs 204, respectively. Moreover, the engagement ribs 204b and 204b of Nijo prepared between engagement rib 204a of this Nijo and 204a make small the ejection dimension from said side edge side to the engagement ribs 204a and 204a of Nijo by the side of the inner circumference of curve Itabe 201 of said cylinder component 200, and a periphery.

[0027] Moreover, a lower limit is covered from the upper limit of this cylinder component 200, and the slots 205 and 205 on Nijo are established in the other side edge surface which covers the longitudinal direction of said cylinder component 200 with which said engagement means 203 is established.

[0028] In the opening side of this slot 205, the flute width of said slot 205 is made into the width of face which can store the both sides of said engagement ribs 204a and 204b as it is, and makes the width of face a little small at the groove bottom side of this slot 205 compared with the width of face by the side of opening. Therefore, as shown in drawing 13 , said cylinder component 200,200 of a pair is arranged so that the crookedness Itabe's 201 inner circumference side may face mutually. When both the cylinder component 200,200 attaches the edge covering the longitudinal direction so that it may touch mutually, Said engagement rib 204b which adjoins each other at said engagement rib 204a by the side of said crookedness Itabe's 201 inner circumference and this engagement rib 204a in said slot 205 by the side of said crookedness Itabe's 201 inner circumference Moreover, said engagement rib 204b which adjoins said engagement rib 204a by the side of said crookedness Itabe's 201 periphery and this engagement rib 204a is stored, respectively in said slot 205 by the side of said crookedness Itabe's 201 periphery. And it is stored so that the tip of said engagement rib 204a may be forced on the side face by the side of the groove bottom of said slot 205. Consequently, both the cylinder component 200,200 can carry out the seal of said side edge side contacted mutually, respectively by two by the side of said crookedness Itabe's 201 inner circumference, and a periphery, the concrete driven in in the barrel constituted by attachment of both the cylinder component 200,200 begins to leak, and the prevention effectiveness is heightened.

[0029] Moreover, the slot 206 covering this crookedness Itabe's 201 hoop direction for inserting in the bottom member 100 mentioned later is established in the inner skin of the crookedness Itabe 201 bottom of said cylinder component 200. Rib 206a projected along this slot 206 is prepared in the groove edge section of the lower veranda of said cylinder component 200 of this slot 206.

[0030] Moreover, \*\*\*\*\* is opened between this crookedness Itabe's 201 upper limit edges, and the flange 207 of the shape of an outside flange covering this crookedness Itabe's 201 hoop direction is formed in the peripheral face of the crookedness Itabe 201 top of said cylinder component 200. It is made into the insertion section 208 of the annular frame 300 mentioned later between this flange 207 and this upper limit edge. The edge by the side of the side edge covering the longitudinal direction of said cylinder component 200 of this flange 207 is set to flat side 207a.

[0031] Moreover, the flange 209 of the shape of an outside flange covering this crookedness Itabe's 201 hoop direction is formed in the peripheral face of the crookedness Itabe 201 bottom of said cylinder component 200.

[0032] subsequently -- as shown in the drawing 1 list at drawing 14 and drawing 15 , while said disc-like bottom member 100 makes the whole surface a flat field -- on the other hand -- being alike -- two or more reinforcing ribs 101...101 of a radial are formed. Moreover, from this edge, the protruding line 102 covering the perimeter of this bottom member 100 opens spacing slightly between said reinforcing ribs 101 prepared in mist or the inside, and is prepared in the edge of this bottom member 100 in the shape of outside breadth towards the near field in which said reinforcing rib 101 is formed from said flat field side of this bottom member 100.

[0033] Subsequently, as shown in drawing 1 , said annular frame 300 is a tabular ring-like frame, and is equipped with the engagement protruding pieces 301 and 301 of the pair projected to the sense which intersects perpendicularly with the both sides of the direction of a diameter of circle which this annular frame 300 forms from one plate surface of this annular frame 300 mostly to this plate surface in a location. The engagement pawl 302 turned inside said annular frame 300 is formed in the point of this engagement protruding piece 301. In addition, from the base of said engagement protruding piece 301, a little, the window hole 303 is formed in the 300th page of this annular frame inside said annular frame 300 in order to make easy shaping of the engagement pawl 302 of said engagement protruding piece 301.

[0034] The shuttering B for shaping concerning the second example is constituted by attaching as follows said cylinder component 200,200 of the pair which has the structure explained above, the bottom member 100, and the annular frame 100.

[0035] First, both the cylinder component 200,200 is combined so that said cylinder component 200,200 of a pair may be arranged so that the inner skin of said crookedness Itabe 201 of this cylinder component 200 may face mutually, and the



edges-on-both-sides side covering the longitudinal direction of both the aforementioned cylinder component 200,200 may be contacted mutually. Said engagement means 202 is formed in the side edge [ the longitudinal direction of said cylinder component 200 ] here. Moreover, since both the aforementioned cylinder component 200,200 that said engagement means 203 is formed in the side edge of another side, and is moreover put together is made into this \*\* and isomorphism To the side edge in which while is put together and said engagement means 202 of said cylinder component 200 is formed The side edge in which said engagement means 203 of said cylinder component 200 of another side put together is formed is contacted. Moreover, the side edge in which said engagement means 202 of said cylinder component 200 of another side combined with the side edge in which while is put together and said engagement means 203 of said cylinder component 200 is formed is formed will be contacted. Said engagement means 202 is said four engagement projected part 202a which consist of two or more ribs here... It consists of 202a. Moreover, said engagement means 203 Since it consists of four engagement plates 203a which has hole 203a" which can store this engagement projected part 202a It stores in hole 203a" of 203a. said each engagement projected part 202a ... 202a -- said each engagement plate 203a ... and -- said -- each -- engagement -- a plate -- 203 -- a ... 203 -- a -- said -- engagement -- an edge -- 203 -- a -- ' -- storing -- putting in -- having had -- said -- each -- engagement -- a projected part -- 202 -- a -- engagement -- an edge -- 202 -- a -- ' -- being engaged -- it can make -- thereby -- said -- both -- a cylinder -- a component -- 200,200 -- above -- having combined -- a condition -- being fixable . Since said engagement plate 203a mutually engaged for each other and said engagement projected part 202a cover a lower limit from the upper limit of said cylinder component 200 and are prepared in four places in the shuttering B concerning especially this example The contact condition between contact marginal covering the longitudinal direction of both the aforementioned cylinder component 200,200 put together It sets in each location of this contact edge top, middle, and the bottom, and it can fix and maintain and fully considers as the structure which leakage \*\*\*\* of the concrete driven in in the barrel formed with both the aforementioned cylinder component 200,200 can fully prevent.

[0036] In the combination of said both cylinder component 200,200 in the slot 206 established in said curve Itabe 201 bottom inner circumference of this both cylinder component 200,200 By storing the edge of said bottom member 100, said bottom member 100 is attached between these both cylinder components 200,200, and the barrel of an owner bottom is constituted so that the flat field of said bottom member 100 may be turned inside the barrel constituted with said both cylinder component 200,200. As shown in drawing 16 here, in the edge of said bottom member 100 Since the protruding line 102 covering the perimeter of this bottom member 100 is formed in the shape of outside breadth towards the side in which said reinforcing rib 101 is formed from the flat field side of said bottom member 100 It faces the edge of said bottom member 100 into said slot 206 storing, and putting in. This protruding line 102 is considered as the configuration contacted elastically in the groove bottom side of said slot 206, after the inner sense has bent and \*\*\*\*(ed) a little, and the seal nature in the joint of said both cylinder component 200,200 and this bottom member 100 is raised.

[0037] Subsequently, said annular frame 300 is inserted in said insertion section 208 currently formed in the up opening edge of the cylinder component 200,200 of the pair attached in this way. While being able to carry out the shape retention of the barrel formed with both the aforementioned cylinder component 200,200 to the circle configuration which this annular frame 300 forms by this, the attachment condition by the side of the upper part of both the cylinder component 200,200 put together can be strengthened. It faces inserting in and uniting. here, the engagement protruding piece 301 which has the engagement pawl 302 of the inner sense at a tip prepares in said annular frame 300 -- having -- \*\*\*\* -- said -- It considers as the configuration in which said engagement pawl 302 of this engagement protruding piece 301 engages with level difference side 207b of this flange 207 of the flat side 207a section bottom of the flange 207 of said cylinder component 200, and said crookedness Itabe 201 outside peripheral surface. Prevention of omission from said insertion section 208 of the annular frame 300 is achieved.

[0038] In this way, concrete will be driven into the interior of said shuttering A for shaping formed with the bottom member 10,100 attached to one, the cylinder component 20,200 which forms a barrel, and the annular frame 30,300, and the shuttering B for shaping, and a specimen will be fabricated. In the shuttering A for shaping applied to said both examples here, and the shuttering B for shaping said bottom member 10,100 -- both said cylinder component 20,200 and the annular frame 30,300 -- although, since it consists of plastic material which is easy to carry out elastic deformation while it compares with a metal etc. and is hard to deform plastically Even if a mallet etc. strikes said cylinder component 20,200 grade so that concrete may spread uniformly in storage space in placing of this concrete, this cylinder component 20,200 grade does not deform. Distortion of the specimen resulting from deformation of this cylinder component 20,200 grade, damage, etc. are not caused. Moreover, after removing said bottom member 10,100 and annular frame 30,300 from said both cylinder component 20 that constitutes a tube-like object, and 20-200,200 in taking out a specimen from the inside of Shuttering A and B, it can carry out easily only by canceling said both cylinder component 20, the engagement means 22 and 23 of 20-200,200, and the engagement condition of 202 and 203. Even if, especially as for concrete, it does not make \*\*\*\*\*, such as a mineral oil, into said shuttering A and B inside with \*\* etc. from having the property to be

hard to adhere to plastics, it is convenient to unmolding of \*\*\*\*\*. Moreover, even if the front face of a specimen and the inside of said cylinder component 20,200 grade are in the condition of having pasted up with time, said cylinder component 20,200 can be easily removed from the front face of a specimen by sagging said cylinder component 20,200 grade outside, and the fabrication operation of a specimen can be performed smoothly. Furthermore, the concrete adhering to said shuttering A and B inner skin can be removed easily, and a reuse is also easy.

[0039] In addition, since dimensional stability is high compared with the case where it considers as the product made from plastics when either [ either / both sides or ] said annular frame 30,300 or said bottom member 10,100 is made into metal, the flatness of the lower limit side of the specimen which will be able to carry out shape retention of the cylinder component 20 of said pair and the opening of the barrel constituted by 20-200,200 to a perfect circle soon, and is fabricated can be raised.

[0040] Moreover, although this \*\*, the cylinder component 20 of the pair of isomorphism, and 20-200,200 constitute the shaping frame of the shape of said cylinder like object with base from the standpoint which aims at reduction of shaping cost, this cylinder component 20 and three or more 20-200,200 may be combined, and said shuttering for shaping may consist of this example.

[0041]

[Effect of the Invention] Since attachment by the bottom member 10,100, the cylinder component 20,200, and the annular frame 30,300 and separation can be performed free according to the shuttering A and B for specimen shaping for concrete strength tests concerning this invention A specimen can be easily taken out from the inside of Shuttering A and B, without being able to fabricate easily the specimen for concrete strength tests demanded by JIS, and damaging Shuttering A and B, the conveyance storage to separate is easy and, moreover, a reuse is possible. Moreover, since Shuttering A and B is a product made from plastics, while being able to spread concrete in Shuttering A and B uniformly and being able to fabricate a specimen correctly, without carrying out deformation etc. even if a mallet etc. strikes Shuttering A and B, while a reuse is made, even if it is lightweight compared with metal shuttering, and safe, and it uses and throws away, it is convenient in cost. [ be easy to deal with it and ] Even if it is the case where the specimen has pasted Shuttering A and B by furthermore carrying out elastic deformation of the shuttering A and B, Shuttering A and B, especially said cylinder component 20,200 can be easily removed from a specimen, without damaging a specimen.

[Translation done.]

\* NOTICES \*

JPO and NCIPI are not responsible for any  
damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

TECHNICAL FIELD

[Industrial Application] This invention relates to the shuttering for fabricating the specimen for the strength tests of concrete.

---

[Translation done.]



\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

PRIOR ART

[Description of the Prior Art] The container which made metal plates conventionally set to JIS, such as a metal form and a tin plate, the shape of a cylinder like object with base as the die frame thru/or container of a specimen for strength tests of concrete, or the nonreturnable container which has a perforated line as shown in JP,62-22048,A is used.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

EFFECT OF THE INVENTION

[Effect of the Invention] Since attachment by the bottom member 10,100, the cylinder component 20,200, and the annular frame 30,300 and separation can be performed free according to the shuttering A and B for specimen shaping for concrete strength tests concerning this invention A specimen can be easily taken out from the inside of Shuttering A and B, without being able to fabricate easily the specimen for concrete strength tests demanded by JIS, and damaging Shuttering A and B, the conveyance storage to separate is easy and, moreover, a reuse is possible. Moreover, since Shuttering A and B is a product made from plastics, while being able to spread concrete in Shuttering A and B uniformly and being able to fabricate a specimen correctly, without carrying out deformation etc. even if a mallet etc. strikes Shuttering A and B, while a reuse is made, even if it is lightweight compared with metal shuttering, and safe, and it uses and throws away, it is convenient in cost. [ be easy to deal with it and ] Even if it is the case where the specimen has pasted Shuttering A and B by furthermore carrying out elastic deformation of the shuttering A and B, Shuttering A and B, especially said cylinder component 20,200 can be easily removed from a specimen, without damaging a specimen.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, since the weight will become large further if the metal form set to JIS is made into the heavy-gage product made from casting in many cases, therefore weight is in an equivalent for itself and concrete is driven in for specimen shaping, it is hard to deal with it. Moreover, since it generally became expensive, it was what is obliged to a repeated reuse while paying an effort to maintenance and management.

[0004] On the other hand, the container which fabricated the metal plate of thin meat, such as a tin plate, in the shape of a cylinder, and formed it Even if it is the case where an impact is given to a container in order to spread uniformly the concrete driven in in the container in a container since it is easy to deform although there is un-arranging [ little ] according to a too heavy amount It was what cannot strike an immediate container with a mallet etc., but puts in this container into the container of another object, and strikes the container of this another object, or needs a shaker. Moreover, since there was no joint in the container itself when taking out the concrete hardened from the inside of this container, the metal plate which constitutes a container might be torn apart with tools, such as cutting pliers, it needed to strip off from the specimen, and the specimen might be damaged during this activity. Therefore, this container was what cannot do a reuse again.

[0005] On the other hand, since the container of JP,62-22048,A has a perforated line beforehand, it tears apart and strips off the side plate which constitutes this container along with this perforated line, and can separate a container and a specimen. Therefore, the ejection of the hardened concrete is comparatively easy, and it is also rare to damage a specimen in this ejection. It was what needs trouble for a reuse not being made, and said side plate tearing apart, and stripping off like the container using the metal plate of said thin meat on the other hand.

[0006] Moreover, since storage, conveyance, etc. must be carried out as it is, without decomposition etc. carrying out a container with a necessary capacity even if it is a time of not fabricating a specimen, it being common in the container of these former is needing a large tooth space for storage etc.

[0007] Then, this invention is easy to deal with it and is safe while being able to fabricate easily and correctly the specimen for concrete strength tests which sweeps away un-arranging [ which the die frame of the specimen for the strength tests of such conventional concrete thru/or the container had ], and is demanded by JIS, and it aims at offering the shuttering for specimen shaping for concrete strength tests which is convenient in cost even if it uses and throws away, while a reuse is made.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

MEANS

[Means for Solving the Problem] In order to attain said purpose, in invention concerning claim 1 The shuttering A and B for specimen shaping for concrete strength tests The disc-like bottom member 10,100 made from plastics, Two or more cylinder components 20 and 20 made from plastics of a cross-section arc which can engage and release mutual [ which is attached to this bottom member 10,100, and is combined with it, and constitutes a barrel ] freely, and 200,200, It considered as the thing of the structure which consists of an annular frame 30,300 made from plastics attached to tubed opening which said two or more cylinder components form.

[0009] In invention concerning claim 2, moreover, said two or more cylinder components 20 and 20-200,200 An attachment contact edge with this cylinder component 20 and other cylinder components which met in the direction of a cylinder axis of said barrel constituted by the combination of 20-200,200 at least The upper limit section, The shuttering A and B for specimen shaping for concrete strength tests was constituted as a thing of the structure mutually attached by the engagement means 22 and 23 formed in the lower limit section and pars intermedia, respectively, and 202 and 203 free [ engaging and releasing ].

[0010] Moreover, the shuttering A and B for specimen shaping for concrete strength tests consisted of invention concerning claim 3 by making either said bottom member 10,100 or said annular frame 30,300 and both sides into metal.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

OPERATION

[Function] The shuttering A and B for specimen shaping for concrete strength tests concerning this invention Two or more cylinder components 20 made from plastics of a cross-section arc which can engage and release mutual [ which is attached to the disc-like bottom member 10,100 and this bottom member 10,100 made from plastics and is combined with them and constitutes a barrel ] freely, and 20-200,200, Since it consists of said two or more cylinder components 20 and an annular frame 30,300 made from plastics attached to tubed opening which 20-200,200 forms, attachment by the bottom member 10,100, the cylinder component 20,200, and the annular frame 30,300 and separation can be performed free. Moreover, the specimen shaping space which forms the barrel which uses the bottom member 10,100 as a bottom, and drives in concrete with the bottom member 10,100 and the cylinder component 20,200 which were attached, and the annular frame 30,300 can be formed.

---

[Translation done.]

## \* NOTICES \*

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

## EXAMPLE

[Example] Below, the typical example of the shuttering for specimen shaping for concrete strength tests concerning this invention is explained.

[0013] First, the shuttering A for shaping applied to the first example based on drawing 1 thru/or drawing 4 is explained. In addition, drawing 1 is the decomposition perspective view of the shuttering A for shaping, and drawing 2 is the A-A line sectional view [ in / a part / a fracture side elevation and drawing 3 , and / in drawing 4 / drawing 3 ] of the shuttering A for shaping. [ the side elevation of the shuttering A for shaping ]

[0014] The shuttering A for specimen shaping for concrete strength tests concerning this example consists of an annular frame 30 attached to tubed opening which the disc-like bottom member 10, the cylinder components 20 and 20 of the pair which is attached to this bottom member 10, and is combined with it, and constitutes a barrel, and the cylinder components 20 and 20 of said pair form. Said bottom member 10, cylinder component 20, and annular frame 30 all fabricate plastic material, and are constituted.

[0015] The bottom member 10 consists of an insertion cylinder part 12 of the shape of short \*\* and a cylinder prepared in the base 11 on a disk, and one field of this base 11. This insertion cylinder part 12 is formed so that the cylinder circumference side may be allotted to \*\*\*\*\* rather than the edge of said base 11. Protruding line 12b of a pair is prepared in wall 12a of this insertion cylinder part 12 at the position of symmetry, and from the edge of the insertion cylinder part 12, towards the base side of this insertion cylinder part 12, this protruding line 12b inclines gently, and is prepared.

[0016] While the cylinder component 20 makes a cross-section semicircle arc, by being combined with other cylinder components 20 which make the pair of the isomorphism said \*\*, it has curve Itabe 21 who can form a cylinder, and the engagement means 22 and 23 for combining with other cylinder components 20 which make a pair are formed in the edges on both sides covering this curve Itabe's 21 longitudinal direction. That is, [ curve Itabe's 21 longitudinal direction ], while while has prepared male level difference side 22a inside curve Itabe 21 at the side edge, the engagement projected parts 22b and 22b of a pair are formed on the field which attends the un-curving side of said curve Itabe 21 of the protruding piece which protrudes on curve Itabe's 21 method of an outside from this side edge. By and the piece of an arm installed in said engagement projected part 22b protrusion direction and this direction from the peripheral face of said curve Itabe 21 between engagement projected part 22b of said pair, and 22b Spacing is opened between said curve Itabe's 21 side edges, long direction tabular engagement Itabe 22c is prepared in it, and the side edge turned to the side edge of said curve Itabe 21 of this engagement Itabe is made almost parallel to said curve Itabe's 21 side edge. Moreover, while having prepared female level difference side 23a in curve Itabe's 21 outside at the side edge of another side covering curve Itabe's 21 longitudinal direction, the engagement pores 23b and 23b of a pair are drilled in Itabe set up towards curve Itabe's 21 side from this side edge. And some Itabe between engagement pore 23b of this pair and 23b cuts and lacks, and engagement crevice 23c is formed. In addition, spacing of the said engagement projected part 22b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20 Spread abbreviation etc. on spacing of the said engagement pore 23b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20. Moreover, let spacing of the said engagement projected part 22b and the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component be an abbreviation equal at interval of the said engagement pore 23b and the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component 20.

[0017] Moreover, the level difference sides 24 and 24 are established in said curve Itabe's 21 up edge and lower edge, and this level difference side 24 and the protruding lines 26 and 26 which incline gently towards about 25 step which forms the level difference side 24 from said curve Itabe's 21 up edge or lower veranda on 24 are \*\*\*\*(ed). Between a step 25, said engagement projected part 22b, or said engagement pore 23b, the reinforcing ribs 27 and 27 which follow the side

edge of another side from one side edge of said curve Itabe 21 are installed.

[0018] In this example, the space which stuffs the concrete for fabricating a cylinder-like specimen is formed by combining said cylinder components 20 and 20 of the pair which has such structure. namely, spacing of the said engagement pore 23b and the up edge of this cylinder component 20 where spacing of the said engagement projected part 22b and the up edge of this cylinder component 20 which are established in the upper part side of said cylinder component 20 is prepared in the upper part side of said cylinder component 20 as mentioned above -- abbreviation -- it is equal. moreover, spacing of the said engagement pore 23b and the lower edge of this cylinder component 20 where the likeness by the side of the lower part of said cylinder component 20 has also received spacing of the said engagement projected part 22b and the lower edge of this cylinder component 20 which are established in the lower part side of said cylinder component -- abbreviation -- it is equal. Female level difference side 23a is prepared in the side edge of the side by which said engagement pore 23b is prepared for male level difference side 22a in the side edge of the side in which said engagement projected part 22b is furthermore prepared. Therefore, engagement projected part 22b of both the cylinder component and engagement pore 23b can be made engaged, if the cylinder components 20 and 20 of a pair are arranged so that the inside peripheral surface of both the cylinder components 20 and 20 may face mutually, making in agreement male level difference side 22a of both the cylinder component 20, and female level difference side 23a. Moreover, the side edge of the side which attends the side edge of said curve Itabe 21 of engagement Itabe 22c of both the cylinder component 20 can be made to engage with engagement crevice 23c. Therefore, in this example, a cylinder object can be formed by attaching isomorphism and said cylinder components 20 and 20 of the pair of this \*\*. In addition, said protruding line 26 of a twist makes a pair to attachment of isomorphism and these cylinder components 20 and 20 of this \*\* on the up outside and lower outside of a tube-like object which these cylinder components 20 and 20 form, and it will be arranged at the symmetry.

[0019] The annular frame 30 consists of a ring-like frame 31 and an insertion cylinder part 32 which covers the ulnar margin of this frame 31 and is attached towards one field of this frame 31, protruding line 32b of a lot is prepared in wall 32a of this insertion cylinder part 32 at the symmetry, and from the edge of the insertion cylinder part 32, towards the base side of this insertion cylinder part 12, this protruding line 32b inclines gently, and is prepared.

[0020] As indicated in drawing 2 thru/or drawing 4 as the bottom member 10 which has such structure, the cylinder component 20 which forms a tube-like object, and the annular frame 30, it can attach to one. According to namely, the level difference sides 24 and 24 established in curve Itabe's 21 top edge and bottom edge which constitute the cylinder components 20 and 20 The outer diameter of the upper part of the barrel formed with the cylinder components 20 and 20, and lower opening Since it has considered as \*\*\*\*\* rather than the bore of the insertion cylinder part 12 of the letter of the circumference of the bottom member 10, and the bore of the insertion cylinder part 32 of the letter of the circumference of the annular frame 30 Lower opening of said barrel can be stored inside the insertion cylinder part 12 of said bottom member 10, and up opening of said barrel can be stored inside the insertion cylinder part 32 of said annular frame 30. Since the direction [ b / the protruding line 26 and the direction of the inclination of 26 which were established in said curve Itabe 21 in this example, and / protruding line 12b prepared in said bottom member 10 and protruding line 32b prepared in said annular frame 30 ] of an inclination is made into the same direction here By rotating this barrel or this bottom member 10, and the annular frame 30 towards the direction of inclinations, such as this protruding line 12b, inserting the bottom member 10 and the annular frame 30 in said barrel These protruding lines 26 and 26, said protruding line 12b, and said protruding line 32b can be engaged, and the bottom member 10 and the annular frame 30 can be densely fixed to the upper and lower sides of the barrel which said cylinder components 20 and 20 form. In addition, said protruding line 26 is \*\*\*\*(ed) by the location in the middle of [ hoop direction abbreviation ] said curve Itabe 21. Since these protruding lines 26 and 26 will be allotted to the approximate line position of symmetry whose center line which passes along both the contact edge of these cylinder components 20 and 20 by the barrel which the cylinder components 20 and 20 put together form was pinched In both the aforementioned contact edge of these cylinder components 20 and 20 put together, abbreviation equalization of the force which turns these cylinder components 20 and 20 produced by tabling with said protruding line 12b and said protruding line 32b inside said barrel, and binds them tight can be carried out. Although a clearance may be generated between [ to which it fastens and the lump force is applied comparatively weakly / said ] contact marginal when [ which joins said both contact edge of said cylinder components 20 and 20 ] it fastens and lump force differs on said contact edge of one side of said barrel, and said contact edge of the other side, said both cylinder component 20 and the attachment condition between 20 are maintainable to stability with equalization of said bolting force. Moreover, if said bottom member 10 and said annular frame 30 are fixed to said barrel in this way Since the path of opening of the barrel which said cylinder components 20 and 20 form does not spread more than the bore of the insertion cylinder part 12 of said bottom member 10, and the insertion cylinder part 32 of said annular frame 30 Even if it receives the force which said cylinder components 20 and 20 can extend to the side with the internal pressure of the



driven-in concrete, shape retention of the configuration of the barrel which resists this force and the cylinder components 20 and 20 made from plastics form can be carried out certainly. Moreover, since the cross-section configuration of the diameter direction of the barrel which said cylinder components 20 and 20 form is established on the 11th page of said base at one even if it is the case where it is distorted in the shape of an ellipse by contraction distortion after shaping of these cylinder components 20 and 20 etc., distortion of said barrel is reformable with said insertion cylinder part 12 of said said bottom member 10 which can be fabricated for the precision comparatively near a perfect circle. In addition, engagement Itabe 22c of the cylinder components 20 and 20 of said lot and engagement crevice 23c As shown in drawing 2 and drawing 3, it considers as the structure engaged for each other in the location in the middle of [ abbreviation ] the barrel formed with said cylinder components 20 and 20. These cylinder components 20 and 20 can extend from the location in the middle of this barrel according to the load of the driven-in concrete, concrete begins to leak or inconvenient prevention by which a specimen is no longer fabricated correctly is achieved.

[0021] Subsequently, the shuttering B for shaping applied to the second example based on drawing 5 thru/or drawing 17 is explained. In addition, the top view which looked at the cylinder component 200 with which drawing 5 constitutes the decomposition perspective view of the shuttering B for shaping, and drawing 6 constitutes the shuttering B for shaping from the outside, The top view where drawing 7 looked at said cylinder component 200 from the inside, the side elevation which looked at drawing 8 from X in drawing 7, The side elevation and drawing 10 which looked at drawing 9 from Y in drawing 7 The top view of said cylinder component 200, A B-B line sectional view [ in / drawing 11 and / in drawing 12 / drawing 6 ] and drawing 13 The important section sectional view of the attachment contact section of said cylinder component 200,200 of a pair, [ this bottom view ] A C-C line sectional view [ in / drawing 14, and / in drawing 15 / drawing 14 ], the important section sectional view in which drawing 16 shows the attachment condition of said bottom member 100 and said cylinder component 200, and drawing 17 are the top views showing the attachment condition of said cylinder component 200 and annular frame 300. [ the bottom view of the bottom member 100 ]

[0022] As shown in drawing 5, the shuttering B for specimen shaping for concrete strength tests concerning this example consists of the disc-like bottom member 100, two or more cylinder components 200 which are attached to this bottom member 100, and are combined with it, and constitute a barrel, and an annular frame 300 attached to tubed opening which said two or more cylinder components 200 form. Also in this example, said bottom member 100, cylinder component 200, and annular frame 300 all fabricate plastic material, and are constituted.

[0023] While said cylinder component 200 makes a cross-section semicircle arc, by being combined with other cylinder components 200 which make the pair of the isomorphism said \*\*, it has curve Itabe 201 who can form a barrel, and the engagement means 202 and 203 for combining with other cylinder components 200 which make a pair are formed in the edges on both sides covering this curve Itabe's 201 longitudinal direction.

[0024] The engagement means 202 formed in the one side edge which covers the longitudinal direction of said cylinder component 200 is four engagement projected part 202a which opens almost equal spacing respectively and is prepared towards a lower limit from the upper limit of this cylinder component 200... It consists of 202a. Each engagement projected part 202a consists of two or more ribs which touch the longitudinal direction \*\*\*\* side edge of said cylinder component 200 in an end while projecting it towards the periphery side of curve Itabe 201 of said cylinder component 200. This rib is constituted so that it may start from said end side gradually towards an other end side and width of face may become large, and it makes the edge turned to the curve side of curve Itabe 201 of said cylinder component 200 engagement marginal 202a'.

[0025] The engagement means 203 formed in the other side edge which covers the longitudinal direction of said cylinder component 200 on the other hand is four engagement plate 203a which opens almost equal spacing respectively and is prepared towards a lower limit from the upper limit of said cylinder component 200... It consists of 203a. Each engagement plate 203a was prepared so that it might project towards the hoop direction outside of curve Itabe 201 of said cylinder component 200, and hole 203a" was \*\*\*\*(ed) in the thickness direction, and it turned to the side edge side covering the longitudinal direction of said cylinder component 200, and is equipped with engagement marginal 203a' almost parallel to this side edge. each aforementioned engagement projected part 202a prepared in the other side edge on which said hole 203a" covers the longitudinal direction of said cylinder component 200 ... it considers as the dimension which can store 202a, respectively.

[0026] As shown in the drawing 7 list at drawing 10, drawing 11, and drawing 12, a lower limit is covered from the upper limit of this cylinder component 200, and the engagement rib 204...204 of Shijo is formed in the one side edge surface which covers the longitudinal direction of said cylinder component 200 with which said engagement means 202 is established. Each engagement rib 204 is formed in parallel to other engagement ribs 204, respectively. Moreover, the engagement ribs 204b and 204b of Nijo prepared between engagement rib 204a of this Nijo and 204a make small the ejection dimension from said side edge side to the engagement ribs 204a and 204a of Nijo by the side of the inner

circumference of curve Itabe 201 of said cylinder component 200, and a periphery.

[0027] Moreover, a lower limit is covered from the upper limit of this cylinder component 200, and the slots 205 and 205 on Nijo are established in the other side edge surface which covers the longitudinal direction of said cylinder component 200 with which said engagement means 203 is established.

[0028] In the opening side of this slot 205, the flute width of said slot 205 is made into the width of face which can store the both sides of said engagement ribs 204a and 204b as it is, and makes the width of face a little small at the groove bottom side of this slot 205 compared with the width of face by the side of opening. Therefore, as shown in drawing 13, said cylinder component 200,200 of a pair is arranged so that the crookedness Itabe's 201 inner circumference side may face mutually. When both the cylinder component 200,200 attaches the edge covering the longitudinal direction so that it may touch mutually, Said engagement rib 204b which adjoins each other at said engagement rib 204a by the side of said crookedness Itabe's 201 inner circumference and this engagement rib 204a in said slot 205 by the side of said crookedness Itabe's 201 inner circumference Moreover, said engagement rib 204b which adjoins said engagement rib 204a by the side of said crookedness Itabe's 201 periphery and this engagement rib 204a is stored, respectively in said slot 205 by the side of said crookedness Itabe's 201 periphery. And it is stored so that the tip of said engagement rib 204a may be forced on the side face by the side of the groove bottom of said slot 205. Consequently, both the cylinder component 200,200 can carry out the seal of said side edge side contacted mutually, respectively by two by the side of said crookedness Itabe's 201 inner circumference, and a periphery, the concrete driven in in the barrel constituted by attachment of both the cylinder component 200,200 begins to leak, and the prevention effectiveness is heightened.

[0029] Moreover, the slot 206 covering this crookedness Itabe's 201 hoop direction for inserting in the bottom member 100 mentioned later is established in the inner skin of the crookedness Itabe 201 bottom of said cylinder component 200. Rib 206a projected along this slot 206 is prepared in the groove edge section of the lower veranda of said cylinder component 200 of this slot 206.

[0030] Moreover, \*\*\*\*\* is opened between this crookedness Itabe's 201 upper limit edges, and the flange 207 of the shape of an outside flange covering this crookedness Itabe's 201 hoop direction is formed in the peripheral face of the crookedness Itabe 201 top of said cylinder component 200. It is made into the insertion section 208 of the annular frame 300 mentioned later between this flange 207 and this upper limit edge. The edge by the side of the side edge covering the longitudinal direction of said cylinder component 200 of this flange 207 is set to flat side 207a.

[0031] Moreover, the flange 209 of the shape of an outside flange covering this crookedness Itabe's 201 hoop direction is formed in the peripheral face of the crookedness Itabe 201 bottom of said cylinder component 200.

[0032] subsequently -- as shown in the drawing 1 list at drawing 14 and drawing 15, while said disc-like bottom member 100 makes the whole surface a flat field -- on the other hand -- being alike -- two or more reinforcing ribs 101...101 of a radial are formed. Moreover, from this edge, the protruding line 102 covering the perimeter of this bottom member 100 opens spacing slightly between said reinforcing ribs 101 prepared in mist or the inside, and is prepared in the edge of this bottom member 100 in the shape of outside breadth towards the near field in which said reinforcing rib 101 is formed from said flat field side of this bottom member 100.

[0033] Subsequently, as shown in drawing 1, said annular frame 300 is a tabular ring-like frame, and is equipped with the engagement protruding pieces 301 and 301 of the pair projected to the sense which intersects perpendicularly with the both sides of the direction of a diameter of circle which this annular frame 300 forms from one plate surface of this annular frame 300 mostly to this plate surface in a location. The engagement pawl 302 turned inside said annular frame 300 is formed in the point of this engagement protruding piece 301. In addition, from the base of said engagement protruding piece 301, a little, the window hole 303 is formed in the 300th page of this annular frame inside said annular frame 300 in order to make easy shaping of the engagement pawl 302 of said engagement protruding piece 301.

[0034] The shuttering B for shaping concerning the second example is constituted by attaching as follows said cylinder component 200,200 of the pair which has the structure explained above, the bottom member 100, and the annular frame 100.

[0035] First, both the cylinder component 200,200 is combined so that said cylinder component 200,200 of a pair may be arranged so that the inner skin of said crookedness Itabe 201 of this cylinder component 200 may face mutually, and the edges-on-both-sides side covering the longitudinal direction of both the aforementioned cylinder component 200,200 may be contacted mutually. Said engagement means 202 is formed in the side edge [ the longitudinal direction of said cylinder component 200 ] here. Moreover, since both the aforementioned cylinder component 200,200 that said engagement means 203 is formed in the side edge of another side, and is moreover put together is made into this \*\* and isomorphism To the side edge in which while is put together and said engagement means 202 of said cylinder component 200 is formed The side edge in which said engagement means 203 of said cylinder component 200 of another side put together is formed is contacted. Moreover, the side edge in which said engagement means 202 of said cylinder component 200 of another side

combined with the side edge in which while is put together and said engagement means 203 of said cylinder component 200 is formed is formed will be contacted. Said engagement means 202 is said four engagement projected part 202a which consist of two or more ribs here... It consists of 202a. Moreover, said engagement means 203 Since it consists of four engagement plates 203a which has hole 203a" which can store this engagement projected part 202a It stores in hole 203a" of 203a. said each engagement projected part 202a ... 202a -- said each engagement plate 203a ... and -- said -- each -- engagement -- a plate -- 203 -- a ... 203 -- a -- said -- engagement -- an edge -- 203 -- a -- ' -- storing -- putting in -- having had -- said -- each -- engagement -- a projected part -- 202 -- a -- engagement -- an edge -- 202 -- a -- ' -- being engaged -- it can make -- thereby -- said -- both -- a cylinder -- a component -- 200,200 -- above -- having combined -- a condition -- being fixable . Since said engagement plate 203a mutually engaged for each other and said engagement projected part 202a cover a lower limit from the upper limit of said cylinder component 200 and are prepared in four places in the shuttering B concerning especially this example The contact condition between contact marginal covering the longitudinal direction of both the aforementioned cylinder component 200,200 put together It sets in each location of this contact edge top, middle, and the bottom, and it can fix and maintain and fully considers as the structure which leakage \*\*\*\* of the concrete driven in in the barrel formed with both the aforementioned cylinder component 200,200 can fully prevent.

[0036] In the combination of said both cylinder component 200,200 in the slot 206 established in said curve Itabe 201 bottom inner circumference of this both cylinder component 200,200 By storing the edge of said bottom member 100, said bottom member 100 is attached between these both cylinder components 200,200, and the barrel of an owner bottom is constituted so that the flat field of said bottom member 100 may be turned inside the barrel constituted with said both cylinder component 200,200. As shown in drawing 16 here, in the edge of said bottom member 100 Since the protruding line 102 covering the perimeter of this bottom member 100 is formed in the shape of outside breadth towards the side in which said reinforcing rib 101 is formed from the flat field side of said bottom member 100 It faces the edge of said bottom member 100 into said slot 206 storing, and putting in. This protruding line 102 is considered as the configuration contacted elastically in the groove bottom side of said slot 206, after the inner sense has bent and \*\*\*\*(ed) a little, and the seal nature in the joint of said both cylinder component 200,200 and this bottom member 100 is raised.

[0037] Subsequently, said annular frame 300 is inserted in said insertion section 208 currently formed in the up opening edge of the cylinder component 200,200 of the pair attached in this way. While being able to carry out the shape retention of the barrel formed with both the aforementioned cylinder component 200,200 to the circle configuration which this annular frame 300 forms by this, the attachment condition by the side of the upper part of both the cylinder component 200,200 put together can be strengthened. It faces inserting in and uniting. here, the engagement protruding piece 301 which has the engagement pawl 302 of the inner sense at a tip prepares in said annular frame 300 -- having -- \*\*\*\* -- said -- It considers as the configuration in which said engagement pawl 302 of this engagement protruding piece 301 engages with level difference side 207b of this flange 207 of the flat side 207a section bottom of the flange 207 of said cylinder component 200, and said crookedness Itabe 201 outside peripheral surface. Prevention of omission from said insertion section 208 of the annular frame 300 is achieved.

[0038] In this way, concrete will be driven into the interior of said shuttering A for shaping formed with the bottom member 10,100 attached to one, the cylinder component 20,200 which forms a barrel, and the annular frame 30,300, and the shuttering B for shaping, and a specimen will be fabricated. In the shuttering A for shaping applied to said both examples here, and the shuttering B for shaping said bottom member 10,100 -- both said cylinder component 20,200 and the annular frame 30,300 -- although, since it consists of plastic material which is easy to carry out elastic deformation while it compares with a metal etc. and is hard to deform plastically Even if a mallet etc. strikes said cylinder component 20,200 grade so that concrete may spread uniformly in storage space in placing of this concrete, this cylinder component 20,200 grade does not deform. Distortion of the specimen resulting from deformation of this cylinder component 20,200 grade, damage, etc. are not caused. Moreover, after removing said bottom member 10,100 and annular frame 30,300 from said both cylinder component 20 that constitutes a tube-like object, and 20-200,200 in taking out a specimen from the inside of Shuttering A and B, it can carry out easily only by canceling said both cylinder component 20, the engagement means 22 and 23 of 20-200,200, and the engagement condition of 202 and 203. Even if, especially as for concrete, it does not make \*\*\*\*\*, such as a mineral oil, into said shuttering A and B inside with \*\* etc. from having the property to be hard to adhere to plastics, it is convenient to un molding of \*\*\*\*\*. Moreover, even if the front face of a specimen and the inside of said cylinder component 20,200 grade are in the condition of having pasted up with time, said cylinder component 20,200 can be easily removed from the front face of a specimen by sagging said cylinder component 20,200 grade outside, and the fabrication operation of a specimen can be performed smoothly. Furthermore, the concrete adhering to said shuttering A and B inner skin can be removed easily, and a reuse is also easy.

[0039] In addition, since dimensional stability is high compared with the case where it considers as the product made from plastics when either [ either / both sides or ] said annular frame 30,300 or said bottom member 10,100 is made into metal,

the flatness of the lower limit side of the specimen which will be able to carry out shape retention of the cylinder component 20 of said pair and the opening of the barrel constituted by 20-200,200 to a perfect circle soon, and is fabricated can be raised.

[0040] Moreover, although this \*\*, the cylinder component 20 of the pair of isomorphism, and 20-200,200 constitute the shaping frame of the shape of said cylinder like object with base from the standpoint which aims at reduction of shaping cost, this cylinder component 20 and three or more 20-200,200 may be combined, and said shuttering for shaping may consist of this example.

---

[Translation done.]

## \* NOTICES \*

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

## DESCRIPTION OF DRAWINGS

## [Brief Description of the Drawings]

- [Drawing 1] It is the decomposition perspective view of the shuttering for shaping concerning the first example.
- [Drawing 2] some shuttering for the said shaping -- it is a fracture side elevation.
- [Drawing 3] It is the side elevation of the shuttering for the said shaping.
- [Drawing 4] It is an A-A line sectional view in drawing 3 .
- [Drawing 5] It is the decomposition perspective view of the shuttering for shaping concerning the second example.
- [Drawing 6] It is the top view which looked at the cylinder component 200 which constitutes the shuttering for the said shaping from the outside.
- [Drawing 7] It is the top view which looked at the cylinder component 200 which constitutes the shuttering for the said shaping from the inside.
- [Drawing 8] It is the side elevation seen from X in drawing 7 .
- [Drawing 9] It is the side elevation seen from Y in drawing 7 .
- [Drawing 10] It is the top view of the cylinder component 200 which constitutes the shuttering for shaping concerning the second example.
- [Drawing 11] It is this bottom view.
- [Drawing 12] It is a B-B line sectional view in drawing 6 .
- [Drawing 13] It is the important section sectional view of the attachment contact section of said cylinder component 200,200 of the pair which constitutes the shuttering for shaping concerning the second example.
- [Drawing 14] It is the bottom view of the bottom member 100 which constitutes the shuttering for the said shaping.
- [Drawing 15] It is a C-C line sectional view in drawing 14 .
- [Drawing 16] It is the important section sectional view showing the attachment condition of the bottom member 100 and the cylinder component 200 which constitute the shuttering for shaping concerning the second example.
- [Drawing 17] It is the top view showing the attachment condition of the cylinder component 200 and the annular frame 300 which constitute the shuttering for the said shaping.

## [Description of Notations]

- 10 Bottom Member
- 11 Base
- 12 Insertion Cylinder Part
- 20 Cylinder Component
- 21 Curve Itabe
- 22 Engagement Means
- 23 Engagement Means
- 24 Level Difference Side
- 25 Step
- 26 Protruding Line
- 27 Reinforcing Rib
- 30 Annular Frame
- 31 Frame
- 32 Insertion Cylinder Part
- 100 Bottom Member
- 101 Reinforcing Rib
- 102 Protruding Line

200 Cylinder Component  
201 Curve Itabe  
202 Engagement Means  
203 Engagement Means  
204 Engagement Rib  
205 Slot  
206 Slot  
207 Flange  
208 Insertion Section  
209 Flange  
300 Annular Frame  
301 Engagement Protruding Piece  
302 Engagement Pawl  
303 Window Hole

---

[Translation done.]

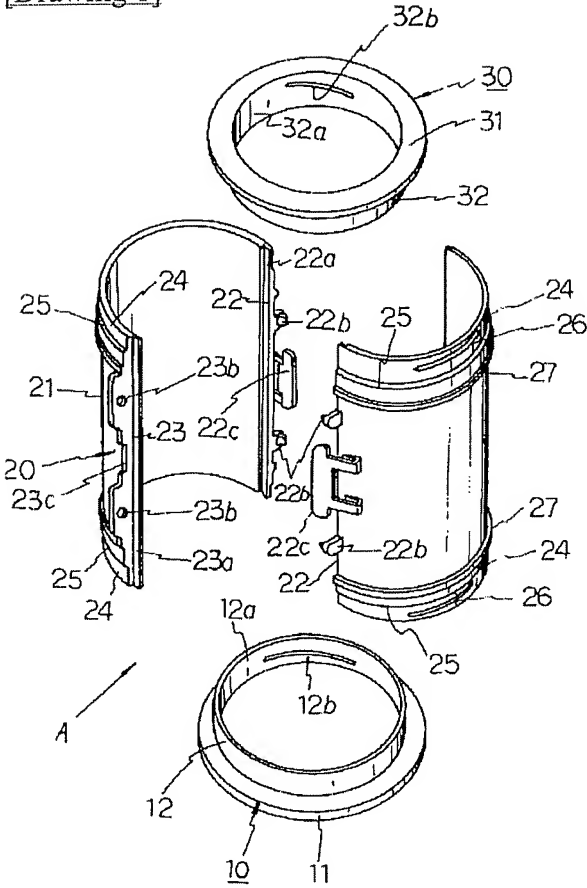
\* NOTICES \*

JPO and NCIPI are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

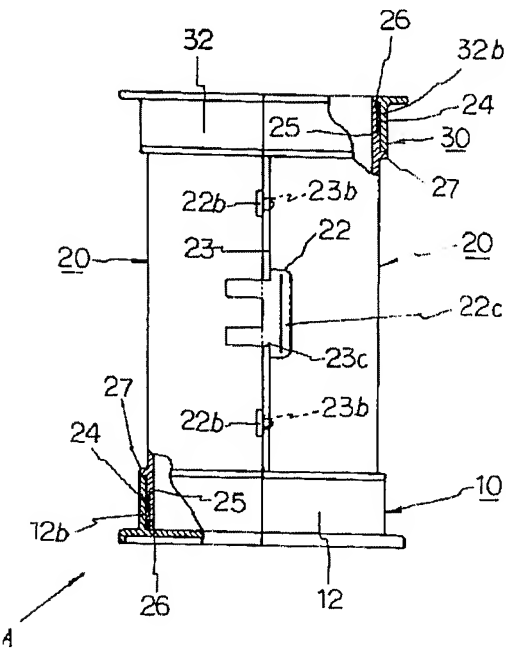
DRAWINGS

[Drawing 1]

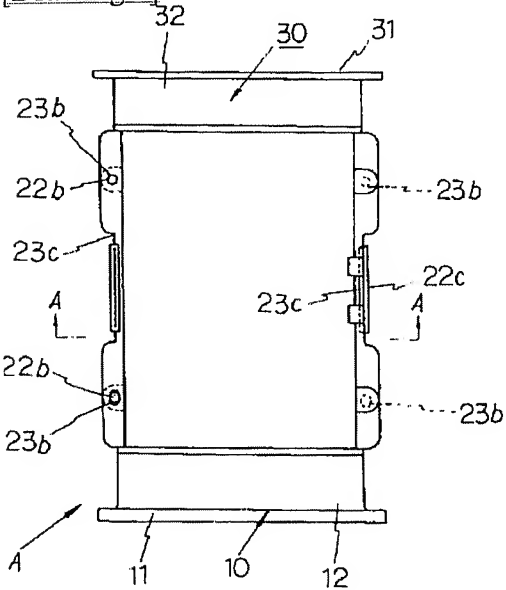


[Drawing 2]

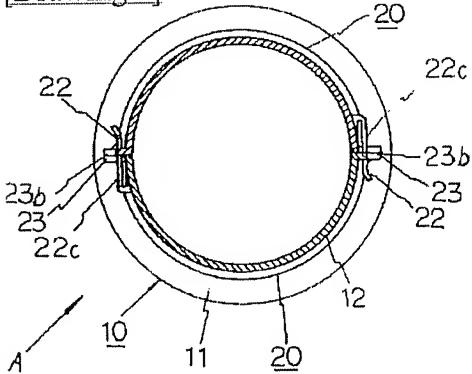




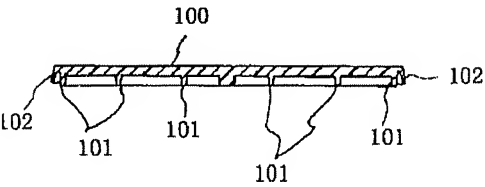
[Drawing 3]



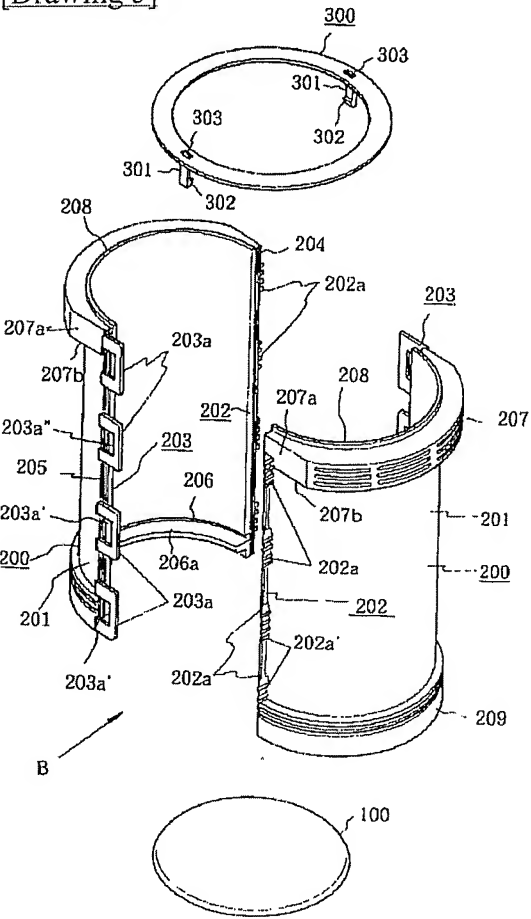
[Drawing 4]



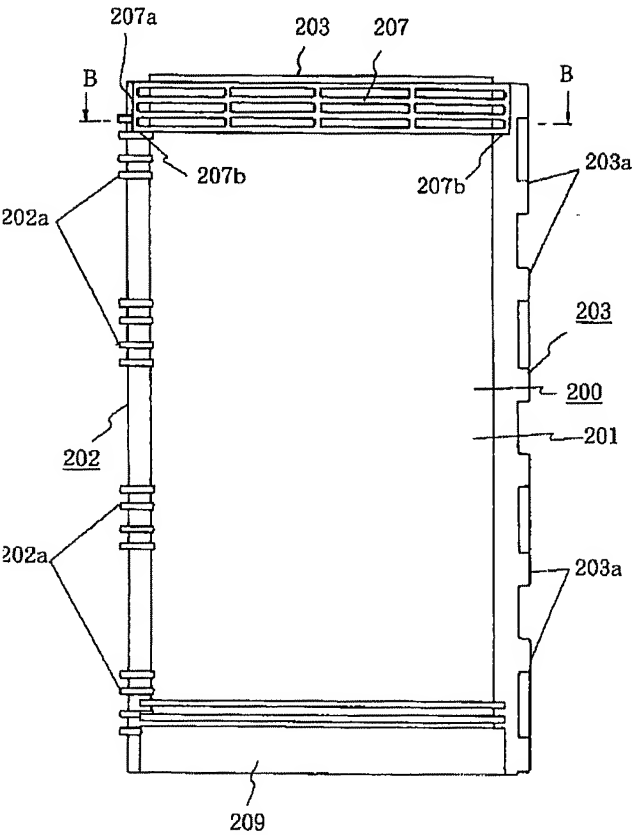
[Drawing 15]



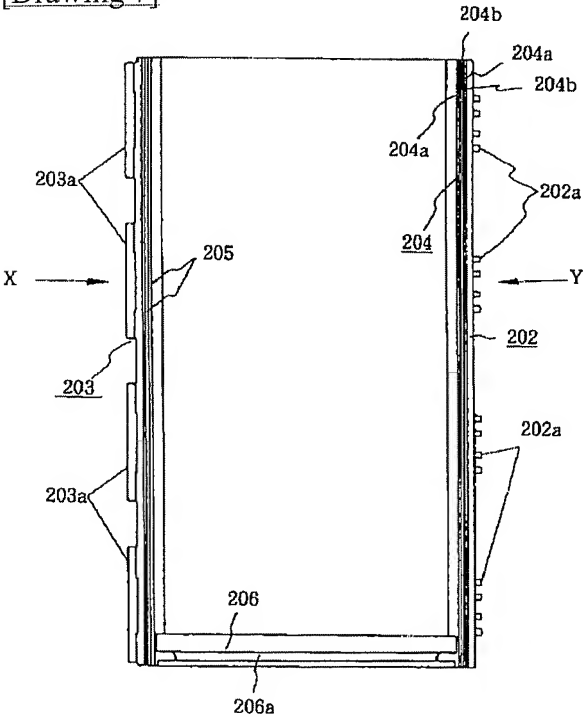
[Drawing 5]



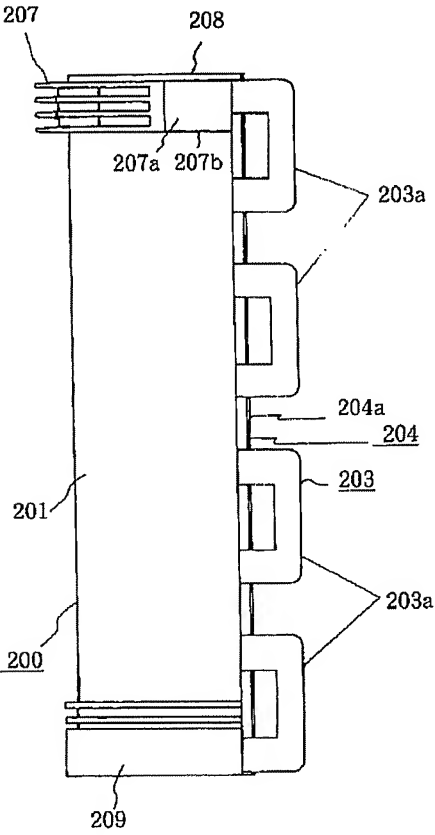
[Drawing 6]



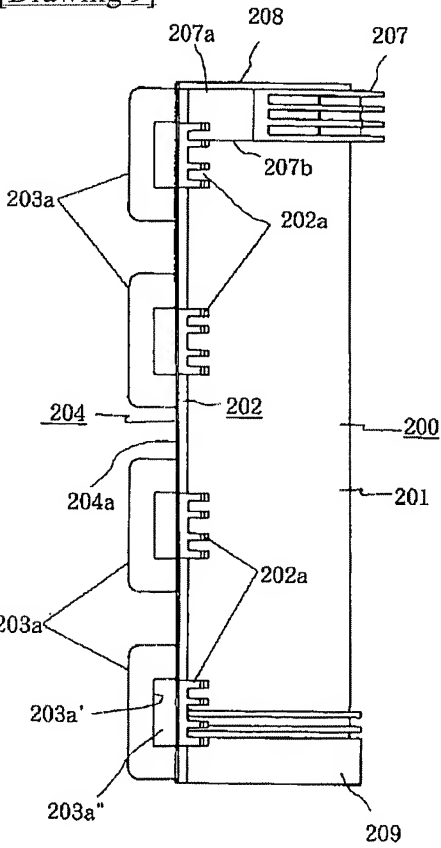
[Drawing 7]



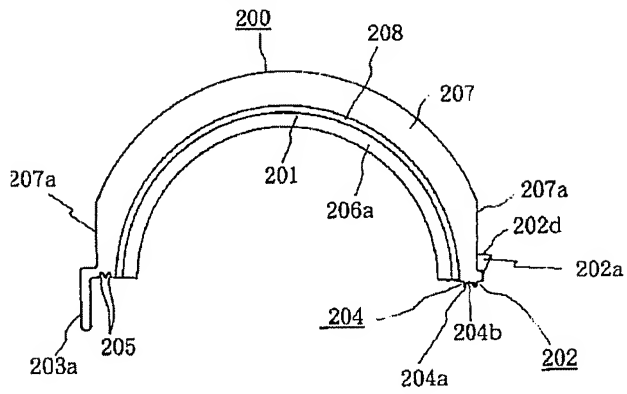
[Drawing 8]



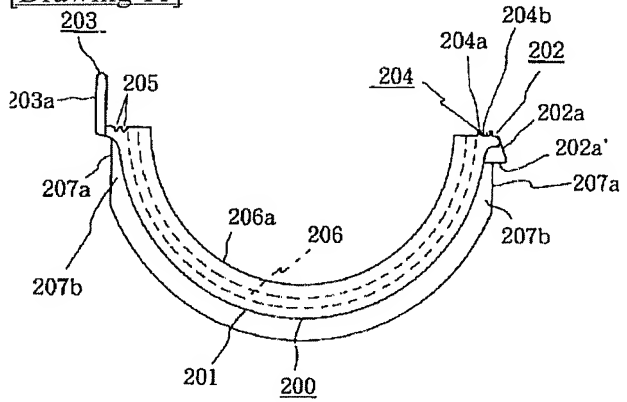
[Drawing 9]



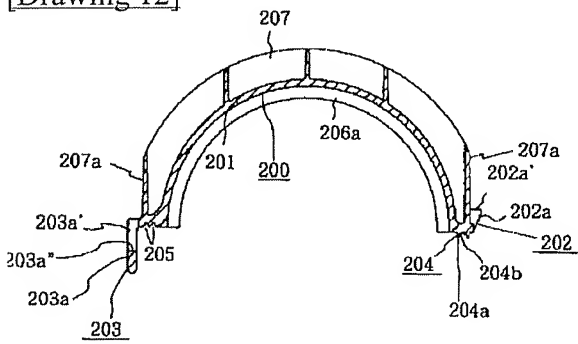
[Drawing 10]



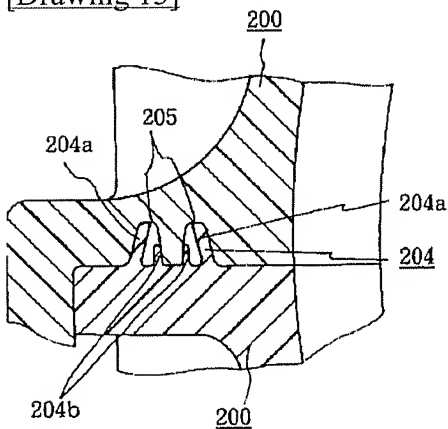
[Drawing 11]



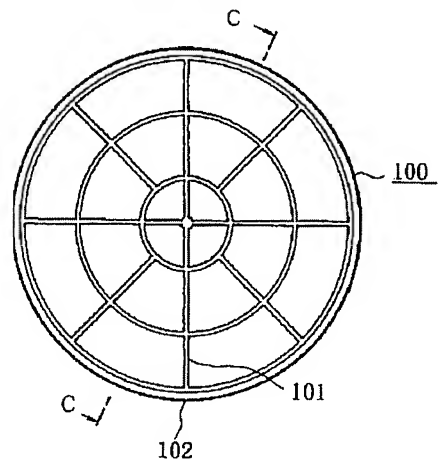
[Drawing 12]



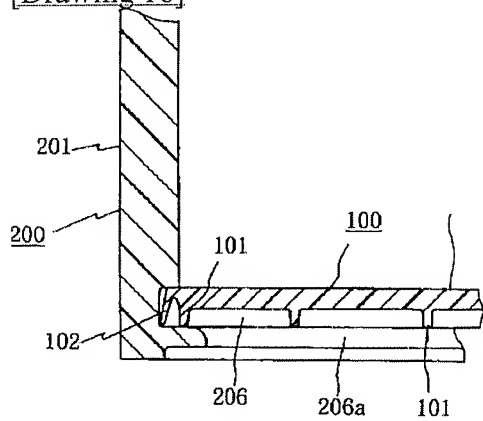
[Drawing 13]



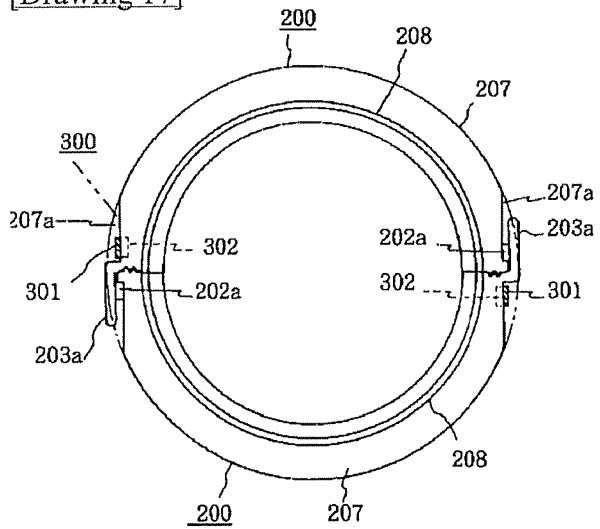
[Drawing 14]



[Drawing 16]



[Drawing 17]



[Translation done.]